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VOLUME 47



THE 'ARABICK' INTEREST OF THE NATURAL PHILOSOPHERS IN SEVENTEENTH-CENTURY ENGLAND

EDITED BY

G.A. RUSSELL



E.J. BRILL
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‘Excesses natural to a small mind in a great place’

Macaulay on Archbishop Laud at Oxford

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The present volume is the product of a memorable symposium, which was organised by the editor in 1986 at the Wellcome Institute for the History of Medicine in London. Conceived as an interdisciplinary project, scholars were invited to investigate specific topics pertaining to 'Arabick' within their area of expertise. It was an exciting, pioneering venture into a previously uncharted aspect of British social and intellectual history.

The Symposium was made possible by a generous grant from the Wellcome Trust with the encouragement and support of both A. R. Hall (who was then Acting Head of the Institute and Co-ordinator of the History Panel for the Trust), and W. F. Bynum, present Academic Director of the Institute. It gives me great pleasure to express my gratitude to them, and to A. C. Crombie for his intellectual stimulus and enthusiasm for the project.

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The book was long to emerge for complex reasons. The essays, with one exception, are by those who participated in the original Symposium. To the contributors—colleagues and friends—who patiently awaited the eventual appearance of their work, I offer my sincere appreciation.

In a collective investigation where there is a great deal of overlap, with some of the key figures occupying several domains, a certain amount of repetition is inevitable. Efforts were made to avoid, or at least minimise, unnecessary duplication. Variations, however, of level of interpretation and individual style of presentation remain.

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INTRODUCTION

THE SEVENTEENTH CENTURY:
THE AGE OF 'ARABICK'

The medieval transmission from Arabic into Latin helped transform European intellectual and scientific development.¹ By the Renaissance, however, it had served its purpose. As Christendom gradually moved into the Age of the Scientific Revolution, there was no longer any need or grounds for Arabic to be of interest to the West.

From this generally accepted point of view, the essays in the present volume investigate a paradox. They show that, contrary to all expectation, there was a remarkably widespread interest in Arabic. In England it led to Arabic professorships in universities, first at Cambridge (1632), then at Oxford (1634), with Arabic as a requirement for the Arts degree. Arabic was taught at such schools as Westminster. Immense collections became established in private hands and in libraries, exemplified by the Bodleian at Oxford. Bi-lingual editions of Arabic texts were printed; grammars and dictionaries were prepared. Islamic histories based on original Arabic sources were written. This enterprise involved theologians, whether Catholic or Anglican, Puritan or Quaker; scholars, whether Royalist or Parliamentary; physicians, astronomers, mathematicians, and philosophers. Most surprising of all: the 'forward-looking' natural philosophers pursued Arabic manuscripts, particularly in astronomy and mathematics. After the founding of the Royal Society (1660), Arabic subjects featured substantially in the correspondence and queries of the Fellows. In short, Arabic interest permeated English society at all levels, to include the court, the clergy, the colleges of universities, diplomatic service as well as mercantile companies.

This was not an isolated phenomenon, unique to England, but emerged against the background of similar developments on the Continent, particularly in the Netherlands, and in close contact with scholars in both Catholic and Protestant countries.² Considering the extent of its diffusion and far-reaching consequences, this 'second wave' of Arabic interest warrants recognition as a significant aspect of seventeenth-century thought. And yet in the intensively scrutinised intellectual and social landscape of the period, it seems to have remained somewhat invisible to the historian³ outside specialised studies.⁴

On the surface, the existence of such extensive interest seems difficult to reconcile with historical perceptions of the developments in post-Renaissance Europe. For example, how could 'Arabic' fit in with the view of the sixteenth and seventeenth centuries as a period of radical transformation of scientific and intellectual ideas—a 'revolution'—which constituted a watershed in the history of Western civilisation?⁵ In interpretations where the seventeenth-century contemporary emphasis in England appears to be on 'progress' over and above the achievements of antiquity, where does one find a niche for any interest in 'medieval' Arabic? There was also the clearly dismissive attitude of some of its leading 'representative' figures. For instance, as far as Bacon (1561-1626) was concerned, the 'Arabians' did not need to be 'mentioned' at all in the 'growth of the sciences' since antiquity; what had been 'added' by them was 'not much, or of much importance'.⁶ Thus the self-perception of the period, with its repudiation of the past—particularly the medieval past, seemed to rule out Arabic interest.

The intellectual 'rehabilitation', in modern research, of the medieval contribution to science, included Arabic, but does not seem to have made it any more relevant to the concerns of the seventeenth century.⁷ Even with the shifting grounds of historical scholarship, where the recent tendency has progressively been more contextual, emphasizing the complex interplay of tradition, continuity and change, turning to areas that had been overlooked or neglected, Arabic interest has yet to receive serious consideration.⁸

The medieval impact of Arabic transmission on Latin Christendom is, perhaps, more comprehensible because the West then was at a disadvantage. Prior to the twelfth century, its meager classical resources were in sharp contrast to the extensive Arabic heritage of Greek and Hellenistic philosophy, science, and technology, enriched by Persian, Chinese, and Indian influences. Furthermore, the Islamic expansion had created a cosmopolitan civilisation with great cities, wealthy courts, and a network of communications through trade from Spain to the borders of China. The largely agrarian, feudal, and inward-looking, monastic social structure of Latin Christendom was eclipsed.⁹

As a consequence, Arabic became a symbol of wealth, power, and intellectual prestige. It was regarded as the key to a treasure house of knowledge, the acquisition of which was eagerly sought by medieval scholars. Once that knowledge was acquired, however, the key could be disregarded. Therefore when Latin translations became available, Arabic had no relevance. The concern had been with the content of the texts, the knowledge 'preserved' in Arabic, and not with the language in which it was written. In fact, the authors of the Latinised Arabic texts were considered in a cultural limbo—at best in the intellectual company of antiquity. Hence, there was no

need to learn the language.¹⁰

With the Renaissance recovery of Greek originals, the transmission from Arabic seemed to have lost even its intellectual prestige. The humanists' hostility to the corrupting influence of Arabic on the classical tradition was accompanied by an intensified hostility to Islam under the Ottoman threat of further encroachment into Eastern Europe. By the seventeenth century, the 'expansion of Europe' and its growing wealth through trade had tilted the balance of power irreversibly westward. With the slow but definite decline of the Ottoman Empire, and the rise of a more secular outlook on the world, Islam appeared progressively less and less relevant.¹¹ Perceived in these terms, therefore, the occurrence of a 'second wave' of 'Arabick' interest is not only unexpected; it is astonishing.

To understand the grounds for the rise of this phenomenon, we need to reconsider the fundamental changes within Europe itself between the fifteenth and the seventeenth centuries. The roots of the 'second wave' of interest in Arabic lie, in fact, in the very movements which seemed to rule out any possible basis for its existence: the Protestant Reformation, the Humanist classical revival, and the 'expansion' of Europe and its emergence as the centre of world trade.

'ARABICK' IN THE SERVICE OF PROTESTANT THEOLOGY

With the Protestant Reformation the Christian world was divided over the fundamental issue of the source of religious authority.¹² For the Catholic Church, it was vested in the doctrine of the apostolic succession, which was repudiated by the Protestants. In the ensuing reassessment of the traditional concepts of religious authority, the primacy acquired by the Bible as the source of doctrine led to the importance of textual accuracy for theological interpretation. It became essential to resurrect the authority of the original texts, not only in Greek, but also in Hebrew in preference to the Latin Vulgate, and to use these for the vernacular translations of Scripture. Thus Hebrew acquired importance for both translation and Biblical exegesis.¹³ Translations, which aimed at producing the 'true' meaning of the original texts rather than the literal rendering, required linguistic skills and intimate acquaintance with Hebrew.¹⁴

There was already a well-established Jewish tradition of Biblical exegesis and commentary on which the Christian 'Hebraic' scholars could draw. This tradition was, however, closely linked to the philological study of Hebrew. Under the influence of Arab grammarians, the study of Hebrew had already evolved in Islamic Spain. The bi-lingual Jewish scholars had access to a

highly developed and systematic study of Arabic grammars and lexicography that had largely arisen in connection with the exegesis of the *Qur'ān*. Some of these comprehensive studies of Hebrew were written in Arabic, employing the terminology of Arabic grammars. They were used in the preparation of Hebrew dictionaries. Thus the importance of Arabic for Hebrew had been recognised and already exploited by Jewish scholars. Subsequently, these studies served as a model for the Hebrew dictionaries of Christian biblical scholars and as the principal source for their study of the scripture. Out of the deep concern to read the Old Testament in the original, Arabic emerged as an ancillary language to Hebrew.¹⁵

There were also scholars who were pursuing the study of all Semitic languages as variations of a common source. They came to believe that knowledge of as many Semitic languages as possible would assist Biblical exegesis. These included Arabic. A manifestation of this conviction was the appearance of polyglot Bibles in the sixteenth century. These were continued in the seventeenth century by both Catholic and Protestant scholars as a series of major collaborative undertakings, exemplified by the Paris Polyglot (1626-45), and Walton's six-volume English Polyglot (1654-57).¹⁶

Regarded as a descendant of Hebrew, Arabic acquired, together with Syriac and Aramaic, an importance for Christian theology. It was believed that Arabic could help elucidate difficult passages not only in the Old Testament but also in the Rabbinical commentaries which in turn were being used for the interpretation of the New Testament. Some of these Rabbinical commentaries were also written in Judaeo-Arabic. For this reason, Maimonides (1135-1204) became popular among Protestant theologians, and later among Oxford scholars and Cambridge Platonists.¹⁷

The idea that Arabic is essential to scriptural study was reinforced by the discovery of the existence of Arabic versions of the Old and New Testaments. Thus Arabic became incorporated into theological training in the second half of the sixteenth century when scholars began to acquire some acquaintance with Arabic to assist with their Hebrew.¹⁸ Accordingly, grammars and lexicons were prepared, based on scriptural texts.¹⁹ Hebrew and Arabic remained linked in the seventeenth century. The close affinity perceived between the two languages is exemplified by the fact that at Oxford both the Laudian Professorship of Arabic and the Regius Professorship of Hebrew were held by the same person—Dr. Edward Pococke, whose expertise also extended to Syriac and Aramaic.

Against this background, it becomes clear why scholars passionately defended Arabic as a language when they despised the religion and remained entirely oblivious to the culture.²⁰ The philological importance of Arabic for

Scripture, explains why initially most of the Arabists and their patrons came from the clergy, such as Lancelot Andrewes (Bishop of Chichester, Ely, and Winchester) and his protégé, at Cambridge, William Bedwell (1563-1632), the 'father of Arabic studies' in England; William Laud (Bishop of London and Archbishop of Canterbury) who created and endowed the chair of Arabic at Oxford for Pococke (1604-1691).

An additional element was the existence of Arabic-speaking Christians. Although the medieval missionary 'chimera' of converting the Muslim was still pursued, its futility was recognised by the Papacy in Rome, which turned its attention instead to the Arabic-speaking Christians under Muslim rule. An outcome of this policy was the Maronite College set up in Rome (1584) which came to provide native-speaking teachers, such as Gabriel Sionita (Jibrā'il al-Sāhyūnī, d. 1648) who taught Arabic in Paris to scholars from Protestant countries.²¹ In their concern to differentiate the Church of England from that of Rome, as well as from other reformed Churches in Europe, the English saw in the Churches of the East a precursor model. These older Christian Communities, such as the Copts and particularly the Greek Church, had resisted incorporation by the Church of Rome. Arabic was seen as a means of establishing communication with these Christians.²²

ARABICK IN THE SERVICE OF SECULAR INTERESTS

The theological interest in Arabic had a secular counterpart arising from the classical scholarship in the Renaissance.²³ The textual criticism, which was stimulated by the rediscovery of Greek texts, did not entirely discredit the transmission from Arabic. Ironically, it also led to the recognition of the importance of Arabic sources. Having access to Greek originals meant that some of the Latin translations of their 'corrupted' Arabic versions could now be put right. At the same time, however, there were other Latin translations which, in addition to Greek, also required Arabic originals.

Such a recognition seems almost inevitable when we consider the enormous complexity of the Arabic transmission. First of all, the Greek originals of some of the translated material did not exist; they had survived only in Arabic. Secondly, many of the Arabic texts which had been translated into Latin were of encyclopaedic proportions of a synthetic, composite nature, such as the *Canon (al-Qānūn)* of Avicenna (Ibn Sīnā, d.1037). Texts, for example, by Rhazes (al-Rāzī, d. 925), Alfarabi (al-Fārābī, d. 950), Haly Abbas ('Alī ibn al-'Abbās al-Majūsī, d.982/95), Abulcasis (Abu'l-Qāṣim al-Zahrāwī, d. c.1109), Averroes (Ibn Rushd, d. 1198) were not direct translations; although derivative, their multiple sources could not always be traced

or reduced to single Greek texts. Some of the works on astronomy, optics, mathematics, alchemy, medicine, and philosophy also had Arabic/Islamic contributions. Among these, the influential *Optics* (*Kitāb al-Manāẓir*) of Alhazen (Ibn al-Haytham; d.1040), printed in 1572, to cite one example, contained new knowledge which was not known to the Greeks.²⁴ These texts had become an essential part of the European intellectual and scientific heritage and of the University curricula both in Catholic and subsequently in Protestant countries. If we take medicine, Avicenna's *Canon* was the standard reading in European universities until the late seventeenth century.²⁵ In fact, the medical training was based on Latinised Arabic texts and their commentaries.²⁶ The extent of the demand for these books is reflected by the number of editions and re-editions between 1425 and 1610 in the publishing centres all over Europe, such as Padua, Venice, Rome, Basel, Strasbourg, Lyons, Frankfurt, and Nüremberg.²⁷

The skeptical attitude to Latin translations, then, provided the grounds for an examination of Arabic sources. In the ensuing textual criticism, Avicenna's *Canon*, the bible of the academic medical profession, took center stage as a key text. In the second Giunta edition of the *Canon* (Venice, 1595), its twelfth-century Latin version by Gerard of Cremona was corrected against the more recent fifteenth-century retranslation of Andrea Alpago.²⁸ Such endeavours demonstrated the philological importance of Arabic for secular subjects.

To consult the Arabic sources, however, scholars needed, in addition to linguistic skills, access to the actual texts, and preferably in print since the manuscripts were difficult to read. Avicenna's *Qānūn* became available as one of the first texts to be printed (1593), using Arabic font, by the newly set up Medici Press in Rome. The crucial need for expertise in Arabic was met, as with the vernacular translations of the Bible, again by Jewish scholars largely from the Iberian peninsula in the aftermath of the Inquisition and of forced conversions to Christianity. In the case of Jewish physicians, Reformation Europe was inhospitable to their presence—prohibiting the general practice of their medicine—but not averse to receiving their philological skills. One can cite Amatus Lusitanus (1511-68), a 'Marrano' physician, who gained refuge in the Ottoman city of Salonica.²⁹ His *Curationum medicinalium centuriae* (written c.1549) went through twenty-three editions as late as 1620. Amatus illustrated the weaknesses of the Latin translation of Avicenna's *Canon*, with actual examples of misreadings in Arabic and the disastrous consequences of such mistranslations for medical practice. By demonstrating the importance of reading medical and scientific texts in the original for textual accuracy, such analyses underscored the essential relevance of Arabic to scholarship, and the need for Arabic glossaries and dictionaries.³⁰ As a

result, Arabic interest emerged for the first time specifically for philological purposes. By the seventeenth century, the case for Arabic, made by Biblical scholars as well as physicians, formed the basis of apologies in lectures and orations for the purpose of establishing its study in universities.

England profited by the emigration of Hebraic scholars from war-torn Central Europe, who further promoted the study of Arabic. Already by the 1620s, there was sufficient interest not only at Cambridge, where the ground was laid by Bedwell, but also at Oxford where Matthias Pasor, Professor of mathematics and theology from Heidelberg, found a highly receptive environment to his proposal of introducing Arabic lectures. Those who gave support were not only theologians and physicians, but also mathematicians (such as Henry Briggs and John Bainbridge) because of their interest in reading Arabic mathematical texts.³¹

ARABIC AND EXPANSION OF EUROPE

A significant factor in the development of interest in Arabic was commerce. The response of Christendom to the first Islamic expansion had been the Reconquista in the Iberian peninsula, and the Crusades. The great voyages of discovery in the fifteenth and sixteenth centuries, undertaken by the Portuguese, were initially a continuation of the same response, and against the same enemy.³² In the seventeenth century, the growing weaknesses of the Islamic world were concealed by the imposing might of the Ottoman Empire, which was still able to advance to the walls of Vienna (1683) and to maintain its hold over the greater part of Southeast Europe. The vital changes, however, in the real relationship of power had already taken place. Europe was stronger, not only militarily and technologically, but also economically. With the consolidation of the Portuguese, and later the Dutch and the English presence in both Asia and Africa, Islamic power was effectively encircled. In time, this encirclement (completed by the Russians along the northern boundaries), led to the reduction of the Muslim spice trade and its diversion into oceanic routes, controlled by the West. With the opening up of the trade routes, the Western merchants in the Middle East became increasingly numerous, wealthy, and influential enough to be able at times to control even policy and education.³³ By the seventeenth century, the trade from the Mediterranean to the Baltic was already in the hands of the Dutch, who had set up the Dutch East India Company. Similarly, the English with their East India, Muscovy, and Levant Companies emerged as a major political and economic force with direct diplomatic relations with the Ottoman Porte.³⁴

The resident embassy as an institution of permanent diplomacy was an earlier Italian innovation (1420-1530). It had arisen out of the Ottoman

expansion into Eastern Europe, with the necessity of exchanging emissaries, signing contracts, forming alliances. The new embassies, following the earlier Venetian and Genoese successes, established legations for purposes of trade which encompassed a much broader network than what was previously required for the Mediterranean.³⁵ With this expansion, where diplomacy and trade were closely linked, the widespread use of Arabic from Morocco and Zanzibar, to India and Malaya was recognised. Arabic was a language which could be of enormous practical use for merchants and navigators for both overland and sea routes to India and beyond as well as for diplomatic purposes in translating official documents and letters from foreign rulers.³⁶

THE LEVANT COMPANY

It is significant that the first fully accredited English ambassador to the Porte in 1583 was commissioned as a merchant, and not as a diplomat, or a scholar. William Harborne had first obtained, from Sultan Murad III, the written promise of a special protection, the capitulations, for English merchants which was confirmed by a charter in 1580/81.³⁷ Originally licenced as the Turkey Company by Queen Elizabeth, it was renamed, on the renewal of its charter, as the Levant Company in 1590. The capitulations granted certain privileges to Christian states, allowing their citizens to reside and to trade in Ottoman dominions without becoming liable to the fiscal and other disabilities imposed on the Sultan's non-Muslim subjects.³⁸

This meant that, for the first time, facility of travel and a peaceful means of contact could be established with the Muslims, and particularly with the Arabic-speaking Christians of the Eastern Church. In contrast to what was limited in the earlier centuries to a handful of pilgrims to the Holy Lands, now scholars with specific interests (such as John Greaves, the Savilian Professor of Astronomy at Oxford) could go on 'scientific' expeditions; and purveyors of information (such as Francis Vernon, Fellow of the Royal Society) could travel, for no other reason than to satisfy their curiosity or 'itch for rambling'.

As the lynchpin in the English diplomatic and commercial representation in the Ottoman Empire, the Levant Company had a profound impact on the development and consolidation of English Arabic interest. With the increasing numbers of merchants, following the establishment of a permanent embassy at Constantinople, and consulates at Smyrna and Aleppo, to appoint chaplains of the Church of England at each of these places became desirable. These appointments were made by the Levant Company with the approval of the ambassador (who also drew his salary from the Company).³⁹ From 1611 onwards, there was a regular sequence of chaplains, beginning with a Fellow of Trinity College Cambridge, William Ford, who arrived in the company of

the new ambassador Sir William Pindar. Most of the chaplains, however, came from Oxford, rather than Cambridge. Most of them already had an interest in Arabic for theological reasons.⁴⁰ Both chaplains and merchants acted as intermediaries to obtain materials and Arabic manuscripts for individual patrons.⁴¹ Chaplaincies served as a means of first hand information which was conveyed through correspondence, diaries and travel accounts. They also provided an opportunity for resident chaplains, such as Edward Pococke, to acquire proficiency in Arabic through native training. Pococke, however, who subsequently became the most distinguished orientalist of his time, was exceptional.⁴²

A major consequence of these developments was the institutionalisation of the study of Arabic at university colleges and even at such schools as Westminster. The first chair of Arabic in England—set up at Cambridge in 1632, and followed by one at Oxford in 1636—was, however, nineteen years after the one at Leiden (1613) in the Netherlands. In Catholic countries such as France and Italy, Arabic chairs had already been established (Paris, 1535 and Rome, 1584) in the sixteenth century.⁴³

The fact that the Cambridge chair of Arabic was endowed by Thomas Adams, a wealthy draper, persuaded by Abraham Wheelocke (1593-1654), its first incumbent, and the Oxford chair by Archbishop Laud is representative of the role of the cloth and the merchant behind its institutionalisation. Coinciding with University Reforms, Arabic was incorporated into the examination system as a philological requirement for the Arts Degree. The initially arid philological training, however, paid off under innovative figures such as Pococke. Instead of using the scriptures, Pococke introduced, for teaching purposes, a wide range of Arabic literary texts as well as bi-lingual translations. (Later Persian and Turkish came to be included as oriental languages.)⁴⁴

In this context, it is worth quoting the letter which was sent to Archbishop Laud by the University of Oxford when Laud made the Arabic endowment perpetual in 1640:

You have greatly enriched the Bodleia-Laudian treasury, by importing Araby to Oxford, but when this store of literature reached us, being confined to books it remained mute, being restrained by its unknown characters; but when a stipend was attached as a key, with a lecturer to unlock the learning of Barbary, the tongue was loosed. Even so it was not made immortal, as it hung on the single thread of your existence, which we hope indeed may be immortal. Then this difficulty was remedied by your untiring munificence, an annual rent from your ancestral lands being conferred upon it. Your patronage of the Arabic language far surpasses the wealth of Araby; being Arabized by you we must necessarily be either happy Arabians or Rocky Arabians; happy if we yield due obedience to your mandates, but otherwise stony and arid.⁴⁵

Expectations of immortality proved to be much more realistic for Arabic than

for the fragile 'thread' of the Archbishop's existence. With the Professorships set up to continue in perpetuity, both at Cambridge and Oxford, Arabic became independent of the waxing and waning of interest. It was for this reason that in spite of the execution of Archbishop Laud and the pressures of the Interregnum, when Parliamentary 'visitors' attempted to remove the Arabic and Hebrew Professorships from Pococke, because of his staunch Royalism, they did not succeed. Arabic could survive, even when student numbers dwindled after the brilliant era of Pococke's scholarship during which Oxford had become a magnet for Continental scholars.

Without qualification, one could say that Arabic as an academic discipline is the achievement of the seventeenth century. Its establishment marks the beginning of an historical perspective and a dispassionate study of a subject which for centuries had been the object of emotionally-charged polemical diatribes.⁴⁶ Pococke's *Specimen historiae Arabum* (1650) is a remarkable example. The brief account of the early history of Islam in the thirteenth-century chronicle of Bar Hebraeus, is expanded from the original fifteen to three-hundred pages with Pococke's own notes and detailed comments. Based on more than seventy Arabic manuscript sources, going back to the ninth century, the *Specimen historiae Arabum* has rightly remained an authoritative source for Arab history and Islamic institutions.⁴⁷

The fact that, in the face of religious intolerance and deeply ingrained prejudice, a detached inquiry into Arabic culture could emerge is a measure, more than any other area, of the fundamental change in the social and intellectual outlook of the period. This 'second wave' of 'Arabick' interest was lost to historians perhaps because it was not an epistemological influence in terms of 'new' knowledge. It was a product of the reworking of the intellectual position of a society in flux—poised between the 'ancients' and the 'moderns'—and a confirmation of their complex aspirations. As such, this Arabic interest is all the more relevant to our understanding of one of the most critical periods in the history of Western thought and of the development of its secular academic institutions.

The fourteen chapters, which constitute the present volume, clearly underscore this fundamental point in different areas of expertise. *P.M. Holt* briefly outlines the background to 'organised Arabic studies' in England, its connections with France, Italy, and the Netherlands; and its emergence, after an initial dependence on the grammars and textbooks printed in Leiden, as a centre of Arabic scholarship. Using the content of the lectures and orations of the leading Continental and English figures, *Holt* summarises the key arguments in support of Arabic which were in circulation. He brings out the importance of Pococke's appointment as a turning point for the future of Arabic studies at Oxford which, in its teaching, collection of manuscripts, and

the printing of books, surpassed Cambridge. In addition to his scholarship, Pococke's innovative teaching methods—with a definite curriculum, based on a variety of original sources (and not the *Qur'ān* alone), using bi-lingual texts—produced a generation of well-trained Arabists and set the standards for subsequent centuries.

The paradox of the seventeenth-century Arabick interest is nowhere better illustrated than with the Fellows of the Royal Society. *M. B. Hall* shows that the wide-ranging interests of 'the wielders of the scientific revolution' included Arabic:

At first thought, it seems unlikely that the Fellows of the Royal Society, founded in 1660 by the leaders of the 'new philosophy' in England for the promotion of natural knowledge, self-confessedly forward-looking modernists, should have concerned themselves with Arabic learning. That they did so throws further light both upon the complexities of the scientific revolution as well as upon the growth of Arabick studies in late seventeenth-century Britain.⁴⁸

Their 'unlikely' interest is revealed through Oldenburg's diligently kept records of the Royal Society (1653/54-1687), which appears to have been a clearing house of queries of all kinds on 'Arabick matters'. Using their correspondence, *Hall* gives an account of how the Arabic interest of the natural philosophers mirrored their omniverous attitude to knowledge, which ranged from the theological, philosophical and scientific topics to the popular, practical, and the utilitarian; how close-knit the community of Continental and English oriental scholarship was; how much they hoped for from Arabic sources; the variety of channels they exploited to gain manuscripts and information; and above all, the importance of the English for Arabic studies.

A. Hamilton argues that what paved the way for the interest in Arabic was also the sympathetic attitude of the Anglican Church to the eastern Christians, particularly the Greek Orthodox Church; and that it was encouraged by theologians, actively continued by Arabists, such as Bedwell (who gave it as one the main reasons for the study of Arabic), Pococke, and others. It was this concern with the eastern Churches as well as with biblical studies which prompted Lancelot Andrewes to patronise Bedwell, in his efforts to introduce Arabic studies into England. Moreover, *Hamilton* brings out the fundamental difference, in the approach to Arabic-speaking Christians, between the Roman Catholic Church (which was proselytising in its aim for a union) and the Protestant, particularly the Anglican (which was scholarly in its interest). The Anglican theologians were attracted, in their attempt to justify the existence of the English national Church, by the example of the independence of the eastern Orthodox Churches from Rome. He assesses the role of the Aleppo factory and the extent of Anglican knowledge of the eastern Chris-

tians through the writings of numerous chaplains of the Levant Company. He shows that on the whole it was the Laudian Anglicans and Royalists, rather than Puritans who took an interest in the eastern Churches and more generally in Arabic studies. He concludes that England did not, however, profit from the presence of Arabic-speaking Christians in the way Rome and France did with the Maronites.

V. Salmon gives an account of the study of Arabic and argues that the characteristics of Arabic (along with Hebrew) may have served as a source of inspiration for the seventeenth-century concern with constructing a universal and philosophical language. She shows that some of the leading scholars of the project were either conversant with Arabic or alternatively closely involved with Arabists at Oxford. On the basis of numerous contemporary surveys, grammars, lexicons, and word lists, she finds evidence for the English origin of Arabic linguistic scholarship. In analysing the motives behind Arabic studies, she also investigates the teaching of Arabic outside Oxford and Cambridge, at private academies, for example, in London.

H. T. Norris takes up the tragic case of Edmund Castell, who was Abraham Wheelocke's successor as Sir Thomas Adams Professor of Arabic (1667-1685) at Cambridge, and the preparation and content of Castell's 4007 page *Lexicon Heptaglotton* (1651-69). Motivated by the study of Arabic as a key to the further understanding of the Scriptures, it took Castell more than seventeen years to complete his *Lexicon*. In the process, it ruined his health and consumed almost his entire family estate. *Norris* views Castell against the close-knit community of scholars, who were similarly motivated, and places them in the context of the rise of the 'science' of comparative religion in England. He also touches on the curious phenomenon that an extraordinary number of leading scholars with Arabic interest came from the same Cambridge region: Francis Burley, Wheelocke, Bedwell, Huntington, Lightfoot and Worthington, Cudworth—the leader of the Cambridge Neoplatonists, and Culverwell.⁴⁹

R. Jones unravels how the commercial failure of an extravagant printing venture played a key role in Arabick learning. The Medici Press at Rome was set up with the objective of printing books for distribution in the eastern Ottoman markets 'to acquire both wealth and souls', and in order to forestall similar attempts by Protestants, who were, at the time, encroaching on Ottoman territories with diplomatic and trade relations. They produced seven publications between 1590/1595. In addition to the two *Gospels*, these included five texts in Arabic science and grammar. In spite of extensive market research, aggressive sales, this unprecedented venture failed. It had, however, unforeseen consequences. *Jones* argues that although dominated in design by the requirements of export to the East, the remaining unsold texts

ultimately played a most significant role in the development of North European Arabic scholarship. They provided the much needed secular reading matter in Arabic for scholars, before the establishment of major manuscript collections in North European countries. Dictionaries were compiled from the vocabulary of the Medici texts. Medicean grammar books were utilised. New critical editions and translations were either stimulated by or based directly on the Medici printed versions. He cites the retranslations of parts of Avicenna's *Qānūn* by numerous physicians, and the widely circulated 'parallels postulate' from the Arabic *Elements* of Euclid, the Latin translation of which, published by John Wallis, subsequently became highly influential among mathematicians. Jones also points out that the extent of the diffusion of these texts can be judged by the marginal notes, in the extant Medici texts, by the leading seventeenth-century scholars in England including Bedwell, Pococke, John Greaves, Castell, Walton, and others. In addition, Jones also draws attention to the importance of these texts as being among the earliest books printed in Arabic—in elegant cursive script—by means of moveable metal type, and based on the design of Arabic manuscripts.

C. Wakefield describes how the Bodleian collections grew from one Arabic manuscript (*Qur'ān*) in 1602 to one thousand and five hundred manuscripts by the end of the century. He gives an account of how they came by gift (on the part of individuals), purchase through the Levant Company, bequest, and even treaty with the Ottoman Porte. The benefactors and the identity of the individuals who donated manuscripts are revealing of the impressive range and extent of the Arabic interest in English society. The development of the Bodleian was in contrast to the library at Cambridge. With its collection of manuscripts, Oxford surpassed Cambridge, not only in its teaching, but also in its printing of Arabic books.

M. Feingold analyses the motives of the benefactors of the Savilian and Laudian Professorships which made Oxford one of the most important centres for the study of mathematical sciences and Arabic. He sees a correlation between their desire for immortality in the absence of a male issue, and the endowments of scholarship to support one discipline and one professor. He describes the shift from the earlier professorships, which supported exclusively the three disciplines—medicine, theology, and law—to the introduction of new chairs as the first attempt in England to encourage 'secular' scholarship and to enlarge vocational learned disciplines. He brings out the novel concepts underlying the Laudian statutes, (which partly derived from the earlier innovative model set by Savile), in incorporating of Arabic as a new discipline into the curriculum at Oxford. The first was to elevate the social status and calibre of the incumbents of the chairs by means of generous remuneration in order to prohibit them from practicing any other profession

while occupying the chair. The result was a highly qualified body of professors who were content not to be lured elsewhere. Secondly, Arabic was seen essentially within a broad humanistic framework of the study of theology based on philology. It was for this reason that the Laudian statutes stipulated that all bachelors of arts (including medicine) attend weekly Arabic lectures. Against this background, the role of 'Arabick' becomes of major significance in the evolution of the English university as a secular academic institution for both instruction and research.

By investigating the extensive manuscript sources, which were used by the mathematicians and astronomers at Oxford and Cambridge, *R. Mercier* is able to identify their research. He shows that the Savilian Professors of Astronomy were not only interested in gleaning information out of the Arabic astronomical texts; they wanted to check the data in those manuscripts against their own observations by actually going to the lands where the readings were originally taken, and with similar instruments especially made for that purpose. Secondly, their use and study of the available Islamic manuscripts—geographical tables, star catalogues, and calendars (as in the exemplary study of Ulugh Beg's calendars by John Greaves)—were directed to specific problems. In publishing star co-ordinates, for example, they brought together a considerable number of sources—which required linguistic skills beyond that of Arabic to include Greek, Persian, and Ottoman Turkish—in order to determine the constancy and variability of solar properties. Thirdly, they were looking for specific manuscripts in their attempts to restore corrupt Latin texts according to Greek sources that were extant only in Arabic.

G. Molland focuses on the Savilian Professors at Oxford and their monumental projects of preparing comprehensive editions of mathematical texts in Arabic. Irrespective of whether they were acquainted with Arabic (as in the case of Edward Bernard, John Collins) or not (as in the case of John Wallis, David Gregory, Edmund Halley), they had one specific objective. Although these scholars knew the significance of Arabic in the development of methods of numerical computation and algebra, the driving force behind their concern was the recovery of Greek mathematics with the aid of Arabic. Molland finds this exemplified by Bernard's ambitious scheme of publishing, in fourteen volumes, virtually all extant Greek mathematics (a substantial amount of which was preserved only in Arabic); and by Halley's completion of *Conics* of Apollonius. *Molland* thus presents the interest in Arabic mathematics as a 'limited lure'.

W. Newman brings to light another area of the Arabick interest: Islamic tradition of alchemy and the alchemical practices of the natural philosophers. He examines four versions of a medieval forgery, *Summa perfectionis*, based on the Latin translation of an eighth-century Arabic work (*Kitāb al-mulk*)

from the classic Jābirian collection. He argues that the popularity of this pseudo-Jābirian medieval work was engineered by giving it a royal pedigree of Arabic origin. It was translated into English by Richard Russell (1678) and appeared in three other versions, two of which by iatrophysicians, under different pseudonyms; and one version in 1650 by William Starkey, a member of Samuel Hartlib's scientific circle, who was associated also with Boyle and Boyle's chemical experiments. He was even known to Newton, who owned a copy of Starkey's *Secrets Reveal'd*. Each of the versions reflects the particular interests of their seventeenth-century authors, and receives emphasis accordingly: corpuscular theory of matter, iatro-chymical practice, principles of alchemical transmutation, and the interpretation in relation to Neoplatonism which was of great interest to a number of Cambridge scholars.

At a time when alchemy was being practiced by no less an illustrious figure than Newton, that a Latinised Arabic Geber would serve as a title for forgeries, corroborates the strength of interest in Arabic and the aura of its prestige as a language in which 'knowledge was lock't'.

A. Wear argues that in medicine there was only a vestigial interest in Arabic; and that unlike the Continent, where the scholarship of humanist medical writers preserved the Latin tradition of classical Arabic medicine, the English emphasis on the vernacular, created a 'national' approach and a preference for English medicine. Furthermore classical Arabic medicine, caught up in the controversy of the 'Galenical-Chymical' physicians, was rejected along with the Latinised Galenic teaching. [Ironically, however, it was the 'chymistry' of Arabic alchemy (*al-kimiyā*) and its experimental tradition which was at the root of the iatrochemistry of the seventeenth century]. At the same time, it was already absorbed into the practice and therapeutics of the seventeenth-century popular medicine. Wear concludes that Arabic medicine was part of the lifeblood of medical learning and that only when it was replaced by new approaches and theories that interest in Arabic re-emerged—this time as a subject of historical study.

One of the Royal Society's recurrent aims, which M. B. Hall brings out, was the compiling of a 'universal natural history'. Its many subjects included geographical, quasi-anthropological (local customs and beliefs) and botanical material for which 'Arabick' became relevant. Residents in the Middle East, travellers, chaplains to the Levant Company, consuls, ambassadors, surgeons were all asked for information. J. Harvey shows that in procuring this information, such men became interested in a variety of plants and bulbs, and actually sent samples (alongside Arabic manuscripts) which became established in English gardens. The fact, these plants were competing with those from the Americas is revealed, for example, in books by such figures as

Sir Thomas Browne, written for John Evelyn. Harvey provides the background which led to the founding of the Sherardian Chair of Botany at Oxford by William Sherard, who made use of his botanical training in his position first as consul, then as ambassador to the Porte in Constantinople. At the same time, Harvey briefly traces the seventeenth-century interest in 'coronary' flowers back to the medieval period.

G. A. Russell focuses on the impact of the Latin translation of the twelfth-century Arabic narrative, *Ḥayy ibn Yaqzān*, entitled the *Philosophus autodidactus*. She shows how its bi-lingual edition, published at Oxford by the Pocockes, father and son, became a major literary event both on the Continent and in England. The Latin version of this unique work served as a catalyst for the 'new philosophy' based on 'experience and reason', as opposed to Cartesian 'innate' ideas. Most significantly, Russell documents the complex circumstances of its direct impact on John Locke, through his close association with both Pocockes at Christ Church, and on the preparation of the early Drafts of Locke's *Essay on Human Understanding*. The discovery of Locke's acquaintance with the '*philosophus autodidactus*' throws light on an unknown aspect of Locke's intellectual development. In addition, Russell also brings out the decisive role of the Arabic work in the formulation of the Quaker manifesto by the leaders of the Society of Friends.

With these essays, the present volume establishes not only the pervasive presence of a 'second wave' of Arabic in England, but also shows this multifaceted interest to be a critical component of the evolution of seventeenth-century thought, and a significant factor to be considered in the development of English academic and social institutions. By unravelling this unexpected strand in the complex skein of activities of the natural philosophers, it also opens new lines of investigation which may pose a further challenge to the accepted historical interpretations of the period.

NOTES

¹ For an overview, see *Science in the Middle Ages*, ed. D. C. Lindberg (Chicago: The University of Chicago Press, 1978), especially, Brian Stock, 'Science, Technology, and Economic Progress in the Early Middle Ages' pp. 1-52; and D. C. Lindberg, 'The Transmission of Greek and Arabic Learning to the West', pp. 52-91. Literally every chapter deals with aspects of this transmission relevant to its topic. There is also a forthcoming volume, *Science in Islamic Civilisation: Greek Sources, Hebrew and Latin Transmission*, eds. R. Rashed and R. Morelon. English ed. (London: Routledge, 1994); French ed. (Paris: Sindbad, 1994).

² See Alastair Hamilton, 'Arabic Studies in the Netherlands in the Sixteenth and Seventeenth Centuries' in *Philologia Arabica (arabische studien en drukken in de Nederlanden in de 16e en 17de eeuw)* (Antwerp: Museum Plantin-Moretus, 1986), pp.

xciv-cxiii.

³ For example, Arabic is not included even in studies whose stated aim is to provide 'an integrated view of history' by placing classical explanations in theology, politics and science within their social context, and with reference to a wide spectrum of topics; see *The Intellectual Revolution of the Seventeenth Century*, ed. Charles Webster (London/Boston: Routledge and Kegan Paul, 1974), pp. 2-3; and C. Webster, *The Great Instauration: Science, Medicine, and Reform 1626-1660* (London: Duckworth, 1975).

⁴ See Alastair Hamilton's excellent study: *William Bedwell, The Arabist 1563-1632* (Leiden: E. J. Brill, 1985), which is more comprehensive than its topic suggests.

⁵ This position, though still highly influential, has been under critical examination with the increasingly contextual approach of recent scholarship. For a review, evaluation, and bibliography of the shifting grounds of historical approaches, see, D. C. Lindberg, 'Conceptions of the Scientific Revolution from Bacon to Butterfield' in *Reappraisals of the Scientific Revolution*, eds. by D. C. Lindberg and R. S. Westfall (London: Cambridge University Press, 1990), pp. 1-26. 'Arabick' interest does not figure in the essays as part of the 'reappraisal'.

⁶ Bacon states that between antiquity and his own, 'The intervening ages of the world, in respect to any rich or flourishing growth of the sciences, were unprosperous. For neither Arabians nor the Schoolmen need to be mentioned, who in the intermediate times rather crushed the sciences with a multitude of treatises, than increased their weight.' Bacon, *New Organon*, Works, trans. J. Spedding, R. Ellis, and D. Heath new ed. (New York: Hurd & Houghton, 1870-72), 4:77; see, Lindberg, 'Conceptions of Scientific Revolution' in *Reappraisals*, pp. 4-5.

⁷ My emphasis here is on the recognition of Arabic interest as part of the concerns of the period, and not on the Arabic roots of early modern science for which there are numerous studies, particularly, in optics; see A. C. Crombie, 'The Mechanistic Hypothesis and the Scientific Study of Vision' in *Science, Optics and Music in Medieval and Early Modern Thought* (London: The Hambledon Press, 1990). This pioneering study was originally published in 1967; D. C. Lindberg, *Theories of Vision from Al-Kindi to Kepler* (Chicago: The University of Chicago Press, 1976); G.A. Russell, 'The Beginnings of Physiological Optics' in *Science in Islamic Civilisation*, eds. Rashed and Morelon. Forthcoming.

⁸ Since the symposium in which the essays of this book took shape, M. Feingold, one of the original participants, has written on 'The Oxford Oriental School' in *The History of the University of Oxford*. Forthcoming.

⁹ For a detailed comparison, see R. W. Southern, *Western Views of Islam in the Middle Ages* (Cambridge, Mass.: Harvard University Press, 1962), ch. i, pp. 1-33; also Dorothee Melitzki, *The Matter of Araby in Medieval England* (New Haven and London: Yale university Press, 1977), especially part one, pp. 3-73.

¹⁰ At the same time, however, Arabic was also the medium of the Qur'ān and of a religion, the existence of which was profoundly disturbing for Christendom. To deal with the threat it presented, there were isolated and short-lived attempts to learn the language for the sole purpose of confuting the Qur'ān and converting the Muslims. Although these were not implemented, the 'missionary' argument for the study of Arabic continued in the seventeenth century. See, Johann Fück, 'Die arabischen Studien in Europa vom 12. bis in den Anfang des 19. Jahrhunderts' in *Beiträge zur Arabistik, Semistik und Islamwissenschaft*, eds. R. Hardtmann and H. Scheel (Leipzig: 1944), pp. 100-106.

¹¹ Bernard Lewis, *The Muslim Discovery of Europe* (London: Weidenfeld and Nicolson Ltd., 1982), especially ch. i, pp. 17-59; 295-303.

¹² For the implications of this questioning of religious authority, see *God and Nature: Historical Essays on the Encounter between Christianity and Science*, eds. D. C. Lindberg, R. Numbers (Los Angeles: University of California Press, 1986); also J.

H. Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge/New York: Cambridge University Press, 1991).

¹³ In a divided Christendom, the position of the English Church was defined against violent controversy between Anglican teaching and Calvinistic Puritan reforms where the common ground was anti-Roman Catholic polemics. Against this background, it is significant that the foundation and endowment of the chairs of Greek and Hebrew at Oxford was confirmed by Henry VIII. See H. Trevor-Roper, *Archbishop Laud 1573-1645* (London/New York: 1965), p. 281.

¹⁴ For example, William Tyndale's English translation (1525-35) of the Old Testament was based on both Greek and Hebrew sources.

¹⁵ E. I. J. Rosenthal, *Judaism and Islam* (London: Thomas Yoseloff - World Jewish Congress, 1961), pp. 72-80. David Kimchi's *Book of Roots* (*Radicum Liber*), for example, was used by Bedwell, see Hamilton, *William Bedwell*, p. 13; also G. Llyod Jones, *The Discovery of Hebrew in Tudor England: a Third Language* (Manchester, 1983), pp. 181-211.

¹⁶ The English *Polyglot* had the assistance of Cambridge and Oxford Arabists such as Bedwell, Wheelocke, Castell, and Pococke as well as the support of Selden, and Ussher. See Hamilton, *Bedwell*, ch. iv, pp. 82-83; also P. M. Holt, 'An Oxford Arabist: Edward Pococke' in *Studies in the History of the Near East* (London: Frank Cass, 1973), pp. 14-15.

¹⁷ Rosenthal, *Judaism and Islam*, p. 80; G. A. Russell, 'Philosophus autodidactus,' ch. xi, pp. 242, 260, below; also Feingold, 'The Oxford Oriental School' in *The History of the University of Oxford*.

¹⁸ Hamilton, *Bedwell*, ch. iv, pp. 80-85.

¹⁹ Robert Jones, 'The Medici Oriental Press (Rome 1584-1614) and Renaissance Arabic Studies', *Exhibition leaflet* at SOAS (May-June 1983); also 'The Arabic and Persian Studies of Giovan Battista Raimondi (c.1536-1614)' (University of London, Warburg Institute, Ph.D. Thesis, 1981). Even as late as 1669, the motivation, for example, behind the preparation of Castell's *Lexicon Heptaglotton* was still for biblical studies.

²⁰ Bedwell is a good example; see, Hamilton, *Bedwell*, ch. 4, especially pp. 66-69.

²¹ This illustrates the close contact between the community of scholars. Born in Lebanon, Gabriel Sionita had studied at the Maronite College and taught oriental languages in Venice and Rome before moving to Paris as Professor of Arabic. His pupils included Pasor, the Professor of Mathematics from Heidelberg, who stimulated Arabic interest at Oxford, and Erpenius, the celebrated Dutch Arabist, who also had lessons from Bedwell; Pococke met Sionita on his way back from Constantinople. Holt, *Studies*, p. 24; Johann Fück, *Die arabischen Studien*, pp. 141; 157-8.

²² Steven Runciman, *The Great Church in Captivity* (Cambridge: At the University Press, 1968), pp. 271-319; Hamilton, *Bedwell*, pp. 74-80.

²³ K. F. Dannenfelt, 'The Renaissance Humanism and the Knowledge of Arabic' in *Studies in the Renaissance*, 2 (1955).

²⁴ For an overview and analysis, see G. A. Russell, 'The Emergence of Physiologic Optics' in Rashed and Morelon, eds., *Science in Islamic Civilisation*; forthcoming.

²⁵ Nancy Siraisi, *Avicenna in Renaissance Italy* (Princeton, N. J.: Princeton University Press, 1987).

²⁶ Nancy Siraisi, *Mediaeval and Early Renaissance Medicine* (Chicago/London: The University of Chicago Press, 1990), ch. 3.

²⁷ For titles and dates see, 'Arabic Science in Western Europe,' *Exhibition List of Books and Manuscripts* drawn from the Wellcome Institute Library for the History of Medicine (1987), pp. 8-12.

²⁸ The first 'Giunta' edition of 1564 was published in Venice by the editors G. P. Mongius and J. Costaeus, both of whom were medical men. The second edition was greatly enlarged by corrections of Cremona's version against Alpagò's with a detailed

commentary which summarised previous discussions of the text. It marks a high point of Renaissance scholarship. See the Wellcome Institute *Exhibition List*, p. 10.

²⁹ G. A. Russell, 'Physicians at the Ottoman Court,' *Medical History*, 34 (1990), p. 258.

³⁰ See H. Friedenwald, 'Amatus Lusitanus,' *Bulletin of the Institute for the History of Medicine*, 5 (1937), pp. 603-53. In the seventeenth century, these textual criticisms, in fact, stimulated physicians to learn Arabic. For example, Peter Kirsten (1575-1640) printed a part of the *Canon* in Arabic with an accompanying glossary to facilitate the study of the text. See, Hamilton, *Bedwell*, ch. iv, pp. 72-73 and 146.

³¹ For a description and bibliography of Arabic studies at Oxford, see M. Feingold, 'The Oxford Oriental School' in *The History of the University of Oxford*.

³² See A. Hamdani, 'Columbus and the Recovery of Jerusalem,' *Journal of the American Oriental Society*, 99.1 (1979), pp. 39-48.

³³ B. Lewis, *Muslim Discovery of Europe*, pp. 33-43 and 295-303; Hugh Trevor-Roper, *The Rise of Christian Europe* (London: Thames and Hudson, 1965), pp. 194-96.

³⁴ H. G. Rawlinson, 'The Embassy of William Harborne to Constantinople, 1583-8,' *Transactions of the Royal Historical Society* (1922); F. L. Baumer, 'England, the Turk and the Common Corps of Christendom,' *The American Historical Review* (1945).

³⁵ Garrett Mattingly, *Renaissance Diplomacy* (London: Penguin Books Ltd, 1965; Jonathan Cape, 1955), pp. 60-77.

³⁶ On the whole, however, consulates relied on resident minorities, such as the Greeks as interpreters, rather than training diplomats.

³⁷ Susan Skilliter, 'The First English Embassy in Istanbul: William Harborne's Estimate of staff and Expenses (1582),' *Mashriq* (Manchester, 1980), p. 30.

³⁸ Lewis, *Muslim Discovery*, pp. 48-49.

³⁹ A. C. Wood, *A History of the Levant Company*, pp. 8-26.

⁴⁰ J. B. Pearson, *A Biographical Sketch of the Chaplains to the Company Maintained at Constantinople, Aleppo and Smyrna* (Cambridge, 1883).

⁴¹ Trevor-Roper, *Archbishop Laud 1573-1645*, pp. 281-82.

⁴² L. Twells, *The Theological Works of the Learned Dr. Pocock, to which is prefixed, An Account of his Life and Writings never before printed* (London, 1740), I, p. 14.

⁴³ See Hamilton, 'Arabic Studies in the Netherlands' in *Philologia Arabica*, pp. xciv-cxiii.

⁴⁴ For Pococke's teaching procedure, see Twells, I, *Works*, pp. 9-10; Holt, 'Edward Pococke,' *Oxoniensia*, pp. 122-23.

⁴⁵ D. S. Margoliouth, 'Laud's Educational Work' in *Lectures on Archbishop Laud*, ed. W. E. Collins (New York: Burth Franklin, 1895), p. 80.

⁴⁶ See Norman Daniel, *Islam and the West, the Making of an Image* (Edinburgh, 1960). The complex attitude of the seventeenth century is reflected in two works on Islam: Henry Stubbe's *An account of the rise and progress of Mahometanism with the life of Mahomet and a vindication of him and his religion from the calumnies of the Christians*, and Humphrey Prideaux's *The true nature of imposture fully display'd in the life of Mahomet: With a discourse annex'd for the vindication of Christianity from this charge. Offered to the consideration of the Deists of the present age*. See P. M. Holt, *A Seventeenth-Century Defender of Islam: Henry Stubbe (1632-76) and his Book* (London: Dr. William's Trust, 1972), pp. 9-29; *idem*, 'Treatment of Arab history by Prideaux, Ockley and Sale' in *Studies*, pp. 50-63.

⁴⁷ Holt, 'Edward Pococke,' *Oxoniensia*, p. 128-9

⁴⁸ Hall, ch. viii, p. 146, below.

⁴⁹ For County connection in the promotion of Arabic studies, see P. M. Holt, 'An Oxford Arabist: Edward Pococke' in *Studies*, p. 25.

P. M. HOLT

THE BACKGROUND TO ARABIC STUDIES IN SEVENTEENTH-CENTURY ENGLAND

It would be anachronistic to speak of a specifically English contribution to Arabic studies in the Middle Ages. Among the leading figures in the twelfth-century renaissance which drew largely on Arabic sources were Englishmen, such as Adelard of Bath (fl. 1130), the translator of al-Khwārizmī's astronomical tables and Euclid's *Elements*; and his contemporary, Robert of Ketton (fl. 1141-50), who translated al-Khwārizmī's work on algebra and made the first Latin version of the Qur'ān under the auspices of Peter the Venerable of Cluny. The English origin of Adelard and Robert has no real bearing, however, on their work, which was not carried out in England (Robert in fact was archdeacon of Pamplona), nor undertaken for national purposes.

Apart from such individual scholars, any traces of a school of Arabic in early twelfth-century England would have arisen from casual circumstances rather than any historical or political necessity. In the later eleventh century relations existed between the Iberian peninsula and Lorraine, which produced a diffusion of Arabic knowledge to the latter region. Then a Lorrainer, Robert of Losinga, was bishop of Hereford between 1079 and 1095, and another, Walcher, became prior of Malvern in 1091. So about the end of the century these two places acquired some importance for Arabic learning.

It has further been suggested that a connection may have existed between the Hereford group and some shadowy indications of the teaching of Arabic at Oxford in the thirteenth and fourteenth centuries. Later writers looked back to a mythical chair of Arabic and other oriental languages at Oxford, one of five allegedly set up by the Council of Vienne in 1312. But this remained a paper scheme: the Oxford chair was to have been maintained by the king of England, and dependence on government funding then as in later times proved unreliable.¹

The modern history of Arabic studies in western Europe begins in the sixteenth century.² Here there is a solitary English precursor in Robert Wakfeld (d.1537), probably a Yorkshireman, certainly a Cambridge graduate, who travelled on the Continent to acquire a knowledge of Hebrew and

Syriac as well as a little Arabic. He taught at Tübingen and Paris, and in 1519 he returned to England, where he became chaplain to Henry VIII. He lectured at Cambridge, and later at Oxford also. During the remainder of the century, the foundations of modern Arabic studies were being laid on the Continent. Three principal centres developed. In Paris the pioneer was Guillaume Postel, who was sent by Francis I to the Levant, where he visited Egypt and Istanbul, collected oriental manuscripts, and acquired a knowledge of Arabic. In 1538 or 1539, shortly after his return from the East, he published an Arabic grammar, which with all its faults supplied the needs of contemporary students. The establishment (under the patronage of Cardinal Ferdinand de' Medici in 1584) of the first press to use movable Arabic type opened the way to the publication of texts at Rome, where the foundation of the Maronite College in the same decade facilitated the contribution of Arabic speakers to the new scholarship. In this connection it is noteworthy that an early production of the Medicean Press, al-Idrisi's *Nuzhat al-mushtāq* (1592), was translated into Latin by two Maronites, Gabriel Sionita and John Hesronita, and was published in Paris in 1619 under the misleading title of *Geographia Nubiensis*. Another Arabic press was set up in the Netherlands by Francis Raphelengius (1539-97). As a young man he had studied Greek and Hebrew, visited Cambridge, and subsequently worked as corrector for a famous printer, Plantin of Antwerp. In 1585 Plantin set up a new press in Leiden, which Raphelengius inherited. He taught himself Arabic, and made himself an Arabic font. He also compiled an Arabic dictionary, which his sons published after his death. An exemplar of the sixteenth-century scholar-printer, Raphelengius was in 1586 appointed professor of Hebrew at the university founded in Leiden twelve years earlier. A Jewish convert, the first professor of Arabic at Leiden, held the chair from 1599 to 1601. His successor (after a long interval) was the great Arabist, Thomas Erpenius, appointed in 1613.³

It is against the background of these developments on the Continent, especially in Protestant Leiden, that the efflorescence of Arabic studies in England took place. William Bedwell (1563-1632),⁴ the patriarch of the English Arabists, was something of an isolated figure in his particular commitment to Arabic and his lack of institutional support, albeit he was one of a circle of Cambridge Hebraists, and enjoyed the encouragement and patronage of Lancelot Andrewes, master of Pembroke Hall and subsequently bishop of Winchester. Bedwell was a friend of Erpenius, and visited Leiden, where he arranged for the printing of his edition of the Arabic version of the Johannine Epistles by the sons of Raphelengius. The leading Arabist of the next generation, Edward Pococke (1604-91),⁵ was a pupil of Bedwell's but

had begun the study of Arabic under Matthias Pasor, a refugee scholar from Heidelberg, who himself had learnt Arabic in Paris from the Maronite, Gabriel Sionita. With Pococke and his contemporary at Cambridge, Abraham Wheelocke (1593-1653) we move into a new period of organized Arabic studies at the universities. The chair of Arabic at Cambridge was established (at first somewhat hesitantly) by Thomas Adams, a London draper, in 1632 for Wheelocke, his fellow-countryman from Shropshire,⁶ while Pococke was designated by Archbishop Laud for the Oxford chair two years later. Thus provision came to be made for the teaching of Arabic at the English universities a generation later than at Leiden, and nearly a century after Postel was appointed professor at Paris. Pococke's eighteenth-century biographer, Leonard Twells, describes the method he followed in his teaching. The textbook he used was a collection of proverbs ascribed to 'Alī b. Abī Tālib, which had been published anonymously in 1629 at Leiden by Jacobus Golius, Erpenius's successor. Twells writes:

Upon this Book, observing the Directions of the *Archbishop* in the Statutes he had provided, he spent an Hour every *Wednesday* in *Vacation-time*, and also in *Lent* explaining the Sense of the Author, and the Things relating to the *Grammar* and *Propriety* of the *Language*; and also showing the Agreement it hath with the *Hebrew* and *Syriack*, as often as there was Occasion. The *Lecture* being ended, he usually tarried for some Time in the publick School, to resolve the Questions of his Hearers, and satisfy them in their Doubts; and always, in the Afternoon, gave Admittance in his *Chamber*, from One-a-Clock till Four, to all that would come to him for further Conference and Direction.⁷

It appears from this account that lectures on Arabic as an optional extra in the Oxford curriculum were relegated to the vacations and Lent, and also that Pococke followed up his weekly lecture-hour with three hours of tutorials. Among his fragmentary papers preserved in the Bodleian is a portion of his lecture notes on these proverbs, and also what seems to be a student's notes on the same course. These, which become thinner and more badly written as they go on, serve to identify the grammar used in connection with the course as Erpenius's shorter publication, *Rudimenta linguæ Arabicæ*, first published at Leiden in 1620.

Two other courses given by Pococke were on the first *Maqāma* of al-Ḥarīrī, and on the twelfth-century *qaṣīda* by al-Ṭughrā'ī known as *Lāmiyyat al-'Ajam*. The first of these texts was published in Golius's reissue of Erpenius's longer grammar entitled *Linguæ Arabicæ tyrocinium* (1656); the second is included with the proverbs of 'Alī, and in 1661 was republished by Pococke himself with a Latin translation as *Carmen Tograi*. The book also includes Pococke's introductory lecture to the course and over two hundred pages of notes, which may be taken as the substance of his teaching on this

text. A full commentary on almost every word deals with syntax and etymology, and frequently makes comparisons with cognate words in Hebrew and Syriac.

It is clear from this that English teachers and students of Arabic were largely dependent on the grammars and textbooks produced in Leiden. On his visit there in 1612, Bedwell had purchased (but had not immediately received) the Arabic type of the Raphelengian Press. In fact, what he finally received was an incomplete set. This passed on his death to Cambridge university. It appears, however, not to have been used and certainly not for the purpose for which it was bequeathed, the printing of Bedwell's *magnum opus*, a much-laboured Arabic lexicon, which never achieved publication. The earliest specimen of Arabic printing from Cambridge is dated 1688, and is of another font. Oxford university in the meantime was using Arabic type produced from equipment also bought in Leiden (although not from the Raphelengian Press) in 1637. This was used to print, among other works, Pococke's editions of historical texts.

To build up collections of manuscripts was a primary object of the Arabists and their patrons in the sixteenth and seventeenth centuries. It was for this purpose that Francis I sent Postel on his tour of the Levant between 1534 and 1537. As the century went on, the development of Western commercial and diplomatic relations with the Ottoman Empire facilitated access for travellers and scholars. The important dates for England were 1581, when Elizabeth I chartered the Levant Company, and 1583, when Sultan Murad III granted (or rather renewed, since an earlier grant in 1580 had been abrogated) capitulations to the Turkey merchants, representatives both of the queen and the Company. Henceforward there was an English ambassador in Istanbul, and English consuls were at various factories in the Levant.

Of these, the most important for the history of Arabic studies in England was the factory at Aleppo. The English merchants, however, showed no great inclination to acquire the local languages: Dudley North, for example, who lived in Turkey between 1661 and 1680, was exceptional, if not unique, in his ability to speak and write Ottoman Turkish. The ordinary members of the Levant Company were therefore inexperienced agents for the scholars in England. The problems of one such are described in a letter of 1624 from Thomas Davies, a merchant in Aleppo, to the biblical scholar James Ussher, subsequently archbishop of Armagh. Davies had obtained a slightly imperfect Samaritan Old Testament, 'which notwithstanding I propose to send by this shipp least I meet not with another.' He had sent to Damascus for a perfect Pentateuch, 'and yf not there to be had to mount Garazin' (Gerizim). A messenger sent to Mount Lebanon and Tripoli was unsuccessful: he could get

one there in two months' time as they wanted parchment to make a copy of one of the books. Furthermore he could not vouch for a Hebrew version on offer,

for neyther my selfe nor any other man here can determine it, only I must be forced to take his word that sells it to me who is a minister of the sect of the Marranites, and by birth a Chaldean but not Scholler, neyther is there any to be found in these parts.⁸

In these circumstances, the royal letter which Laud obtained 1634, requiring each of the Company's ships to bring back a Persian or Arabic manuscript may not greatly have enriched his collection.

The principal service of the Company to scholars and scholarship was rendered by its chaplains. Outstanding among them was Pococke himself, who was chaplain at Aleppo from 1630 to 1635. One of his predecessors there had been Charles Robson, whose *Newes from Aleppo*, published in 1628, gave an account of his journey to Aleppo, and described that city. Later travel books were written by Thomas Smith (at Istanbul in 1668) and Henry Maundrell (Aleppo, 1695-1701). Smith, like John Covel, his successor at Istanbul, wrote about the Greek Church. Another chaplain at Aleppo, Robert Huntington, who was there from 1671 to 1681, was one of the great collectors of oriental manuscripts in this period. Finally, and as an anticlimax, John Luke, who was chaplain at Smyrna from 1662 to 1669, went on to hold the Sir Thomas Adams Chair at Cambridge from 1685 to 1702 but, according to one of his twentieth-century successors, 'left no recorded impress on Arabic studies.'⁹

While he was at Aleppo, Pococke made the acquaintance of a Muslim named al-Darwish Aḥmad, who was probably one of his Arabic teachers there. During a second visit to the Levant, which Pococke made in 1637-41 to collect oriental manuscripts, Pococke and al-Darwish Aḥmad kept in touch. A number of al-Darwish Aḥmad's letters are preserved in the Bodleian, and these show that he was both transcribing and purchasing manuscripts on Pococke's behalf. The letters throw an interesting light on these activities, and provide evidence of growing Western competition to obtain manuscripts, as the following excerpt from one of the letters shows. It refers to Jacobus Golius, who had spent eighteen months in Aleppo shortly before Pococke went out there as chaplain, and to Golius's brother, Peter, who became a Carmelite, and must have been in or near Aleppo when the letter was written. The 'Girolamo' referred to, probably a dragoman at the English factory, was acting as Pococke's agent in these transactions. Al-Darwish Aḥmad writes:

Whatever book you want, write its name in Arabic, and send it to Girolamo, and I will send you everything you want. Send and tell Girolamo also, if I bring a

suitable book to take it, for Golius the Fleming has sent to ask his brother for most of the books I want to send, especially the book *Ṣubḥ al-a'shā*. He [Girolamo] did not wish to take it, so I went myself to the son of the scribe, and outbid the brother of Jacobus Golius, and took it, and brought it to Girolamo, so this was the means of obtaining it.¹⁰

The result of such activities was that by the end of the seventeenth-century the Bodleian had acquired an impressive collection of Arabic and other oriental manuscripts. Chief among these were Laud's great donations, Pococke's own collection (purchased from his widow in 1692), and an important part of Huntington's collection, also purchased in 1692-3. The manuscripts of Narcissus Marsh did not come to the Bodleian until 1713, but they are essentially a seventeenth-century collection comprising material acquired from Huntington and Golius. Oddly enough, the manuscript collection of Golius's predecessor, Erpenius, came to form the foundation of the Arabic holdings at Cambridge. Erpenius had intended them to go to his own university of Leiden, but they were bought by the duke of Buckingham in 1625-6, when he was in the Netherlands. His intention to present the collection to the university of Cambridge, of which he was chancellor, was frustrated by his assassination in 1628, and the manuscripts were ultimately obtained from his widow. The anxious and exasperating delays suffered in the meantime are reflected in a letter from Adams to Wheelocke, written on 30 March 1632:

... whatsoever the feare at Cambridge be least these Orientall bookes will be diverted, yet I hope your Universitie is in better likelihood to have them in regard of some late endeavours then in truth it was formerly, howsoever supposed otherwise. The certeinty is this, Mr Howlsworth uppon the receipt of your letter 3 wickes agoe (as I take it) went immediately to the house of the Dutches and spake to Mr Bowles her Chapleyn who promised his furtherance and to moove the Dutches about them within a few daies, and Mr Houlesworth replying that my L: of Lincolne had already made way to the Dutches about them, Mr Bowles answered, I wish he had spake unto her, but he did not, onely he acknouledged he spake unto him about them. The second time Mr Holsworth repayingr thither recd this answeere from Mr Bowles that the dutches replyeth that shee would consider of it. Then did Mr Holsworth understand privately that there was great meanes used to gaine the bookes for Oxford. The 3rd time Mr Holsworth went to Mr Boules for the dutches wh was that shee would speake to the king about them. Heeruppon Mr Holsworth acquainted the Earle of Dover being his parishioner with the busines and prepared him wth severall arguments to the dutches but not meeting wth her he went to my Lord of Holland by whom meanes was used to his maiestie, and thus it is hoped that the iewells will be reserved for Cambridge and tomorrow this nobleman aforementioned will stir againe about it and we hope we shall understand the danger is prevented. Thus you will still say Praised be the Lord daily even the God that helpeth us and poureth his benefites uppon us.¹¹

But not until 8 June was Adams able to assure Wheelocke that

the bookes are faithfully promised to be sent to Cambridg this wicke and . . . [Holdsworth's] servant tould me, he supposed he saw the trunkes at the carriers wherin they were, directed to doctor Mason of St Iohns (as I remember).¹²

What, in the opinion of these seventeenth-century scholars, was to be gained from a knowledge of Arabic? Some idea of their views may be obtained from their inaugural lectures and the introductions to their publications. Bedwell's preface to his *Johannine Epistles*, published in 1612, stresses the wide extent of the lands inhabited by Muslims, 'from the furthest shores of the extreme West, that is from the Fortunate Islands, even to the islands of the Moluccas in the extreme East.' He goes on to say that

in almost all these places, the privileges and diplomas of kings and princes, the instruments and contracts of merchants and nobles, finally the familiar letters of all, are expressed and written almost solely in this Arabic language.

He passes on to assert the importance of Arabic to scholars, assuring his reader that 'no language (Greek and Latin excepted) contain more records of solid and scientific erudition.' A knowledge of Arabic is valuable to students of theology, medicine, philosophy and mathematics; while ancient writers, whose works are lost in their originals, 'overwhelmed by darkness, lie in obscurity.' Finally he speaks of Arabic as ancillary to Hebrew and Old Testament studies.¹³

Bedwell's remarks on the role of Arabic in trade and diplomacy are not followed up by later writers, who otherwise on the whole ring changes on the themes he adumbrated. Matthias Pasor's *Oratio pro linguæ Arabicæ professione*, delivered at Oxford in 1626, and published in the following year, speaks like Bedwell of the wide diffusion of Arabic:

in Turkey, Persia, India and Tartary, where the superstition of Mahomet rages, even though other languages may be in common use, yet in almost every house there will be at least one who understands Arabic.

Pasor places first among the uses of Arabic to Christians its utility in Hebrew and biblical scholarship. A Protestant refugee, he has already said that oriental and Greek studies are needed to 'purge the Augean stable of papistical superstitions, and to wash away the filth of the Schoolmen's sophistry'. A knowledge of Arabic, he continues, enables Western Christendom to bring consolation to the distressed Christians under Muslim rule, and to attempt the conversion of the Muslims themselves. This is a theme which was to receive some emphasis later in the century, when an interest developed, if not in the conversion of Muslims to Christianity, at least in the conversion of Oriental

Christians to Anglicanism. Pococke himself published an Arabic translation of the Anglican catechism in 1671, and of the liturgy three years later. The latter was done at the request of Huntington, who distributed Pococke's missionary publications in Aleppo. Pasor has more to say than Bedwell about the value of Arabic to Western learning, and speaks particularly of Arabian writers on medicine and chemistry. Many names both of diseases and remedies, he says, are Arabic. Al-Rāzī's work, *al-Ḥāwī*, comprises the work of over three hundred Arabian physicians. In the translations of Avicenna's *Canon*, there are so many discrepancies and obscurities that a knowledge of Arabic is necessary to reach the sense. Philosophy, physics, mathematics, history and poetry can all be better studied with a knowledge of Arabic and he even asserts that 'the books of Livy, the loss of which Latin bewails, are extant in Arabic'.

The importance ascribed by Pasor to 'Arabian' science is echoed ten years later in the lecture entitled *De linguæ Arabicæ utilitate et præstantia*, delivered by Thomas Greaves in 1637, and published in 1639. Thomas Greaves was at this time deputizing for Pococke, who had gone to Istanbul on his second visit to the Levant. After speaking of the wide geographical range and copious vocabulary of Arabic, Greaves goes on to mention its literary and scientific treasures. The Arabs, he says, preserved the learning of the ancients in the time of barbarism, and their own discoveries are also important. 'Another Lyceum has been opened to us by the great Averroes, into whom any Pythagorean would swear that the genius and soul of Aristotle himself had migrated.' Avicenna is outstanding in medicine and eloquence. The Arabian geographers transmitted the learning of Ptolemy, and described almost the whole globe. Chief among them is Abu'l-Fidā'. Their rulers cultivated the sciences, and this explains their rapid cultural development. Although their academies have mostly been destroyed by the Turks (an ill-informed remark), copious libraries still survive.

The value of Arabian science thus became a commonplace of Western scholars in the seventeenth-century and even subsequently. The discourse of a later professor at Oxford, Thomas Hunt, *De antiquitate, elegantia, utilitate, linguæ Arabicæ*, pronounced in 1738, deals at some length with the Arabic writers on medicine, science and mathematics. Yet nothing much came of all this, and in conclusion one may perhaps speculate on the reason for the comparative neglect of this part of the Arabian heritage. Indeed for all their respectful references to the works of the Arabian physicians and scientists, the Arabists at the English universities were not greatly interested in them. They themselves were after all primarily clergymen by training and vocation, and valued Arabic above all as ancillary to the study of Hebrew and the Bible.

Bedwell's edition of the Johannine Epistles is an early instance of this predilection. Then in the middle years of the century came the great team project which resulted in the London Polyglot (1654-7). Among the English orientalist who contributed to it in various ways were Wheelocke and Pococke, with their successors at Cambridge and Oxford respectively - Edmund Castell and Thomas Hyde, and also Thomas Greaves. On the other hand, the scientists, mathematicians and physicians who had an interest in the legacy of the Arabians were for the most part amateurs in the oriental languages. Exceptional among them was Thomas Greaves' brother, John Greaves, Pococke's travelling-companion in 1637; he was a mathematician and an astronomer. Among his publications were a Persian grammar and the text (with a Latin translation) of part of the geography of Abu'l-Fidā'. The imbalance between the interest in Arabic of the humanists and theologians on the one hand, and of the physicians and scientists on the other, reflected the changing intellectual attitude of scientists as the seventeenth century went on—a change aptly summarized in the motto of the Royal Society, *Nullius in verbo*. This shift from authority to experiment as the touchstone of scientific knowledge inevitably rendered obsolete the works of the ancients and the Arabians alike.

The publication of the London Polyglot and the foundation of the Royal Society, both events of a single decade at mid-century, symbolize the fact that the motives which had fostered Arabic studies in the first half of the century were about to reach their term. Pococke published his last Arabic text (apart from missionary literature) in 1663 and in the same year he wrote to Thomas Greaves, 'The Genius of the Times, as for these Studies, is altered since you and I first set about them, and few will be persuaded they are worthy taking notice of.'¹⁴ A similar loss of interest was noticeable at Cambridge. Castell was appointed professor in 1667. 'His Lectures were heard first with great Applause, but, in a few Years, were so much neglected, that, being easy, and disposed to be pleasant, he put up this Affix upon the School Gates: *Arabicae Linguae Prælector cras ibit in Desertum*.'

NOTES

¹ See U. Monneret de Villard, *Lo Studio dell'Islām in Europa nel XII e nel XIII Secolo* (Vatican City, 1944).

² A useful introduction is provided by J. Fück, *Die arabischen Studien in Europa bis in den Anfängen des 20. Jahrhunderts* (Leipzig, 1955).

³ J. Brugman & Schröder, *Arabic Studies in the Netherlands* (Leiden, 1979).

⁴ Alastair Hamilton, *William Bedwell, the Arabist 1563-1632* (Leiden, 1985).

⁵ Leonard Twells, *The Theological Works of the learned Dr Pocock*, 2 vols. (London, 1740), I, pp. 9-10. Hereafter Twells, *Works*. It was republished anony-

mously with modernized spelling by A.C. (Alexander Chalmers), *The Lives of Dr. Edward Pocock, . . . Dr. Zachary Pearce, . . . Dr. Thomas Newton, . . . the Rev. Philip Skelton*, 2 vols. (London, 1816).

⁶ Arthur J. Arberry, *The Cambridge school of Arabic* (Cambridge, 1948). Hereafter Arberry, *Cambridge School*.

⁷ Twells, *Works*, I, p. 9-10.

⁸ Cambridge University Library, MS.Dd.2.13.1, f. 1.

⁹ Arberry, *Cambridge School*, p. 13.

¹⁰ Bodleian Library, Oxford, MS.Poc.432, f. 7. For translations of the letters from al-Darwish Ahmad, see P. M. Holt, *Studies in the History of the Near East* (London, 1973), pp. 42-5. Hereafter Holt, *Studies*.

¹¹ Cambridge University Library, MS.Dd.3.12.IV (22). The letters are transcribed in Holt, *Studies*, pp. 37-42.

¹² *Ibid.*, (10).

¹³ W. Bedwell, *D. Iohannis apostoli et evangelistae epistolae catholicae omnes* (Leiden, 1612), Praefatio. Reprinted in Hamilton, *William Bedwell*, pp. 118-29.

¹⁴ Twells, *Works*, I, p. 60.

¹⁵ Twells, *Works*, I, p. 51.

ALASTAIR HAMILTON

THE ENGLISH INTEREST IN THE ARABIC-SPEAKING CHRISTIANS

Many reasons were given for studying Arabic in the sixteenth and seventeenth centuries. Since most practitioners were theologians, theological arguments for learning the language of the Qur'ān tended to prevail. One of these was the presence of the Arabic-speaking Christians: Greek Orthodox, Copts, Jacobites, Armenians, Maronites and Nestorians. Under Ottoman rule, they were regarded in the west as the victims of persecution who should in some way be assisted and possibly even liberated. Certain distinctions were made between these eastern Churches.

The one which aroused the greatest interest and the greatest sympathy was the Greek Orthodox Church. With a little good will on either side its doctrine was considered reconcilable with western Christianity. Just as the Greek Church had gradually drifted away from the west over the centuries so, it was believed, the two forms of Christianity might again drift together. The main doctrinal point of disagreement, the so-called dual procession of the Holy Ghost from the Father and the Son which the Greeks rejected, could surely one day be surmounted. Where the other eastern Churches were concerned matters were different. The Nestorians, with their distinction of the two persons in Christ, and the traditionally monophysite Churches of the Copts, the Jacobites and the Armenians who believed in the single, divine nature of Christ, were associated with the great heresies of the fifth century. Even the Maronites, officially in communion with Rome since the twelfth century, remained strongly tinged by the seventh-century heresy of monothelitism which admitted a single will in Christ. For the west to accept these other Churches on their own terms was by no means easy—yet Christians they remained. The western attitude was consequently marked by a combination of attraction and repugnance which increased with closer knowledge.

ROMAN CATHOLIC AND PROTESTANT ATTITUDES

The Church of Rome had long striven for a reunion with the eastern Churches. At the time of the Crusades union had been achieved with the Maronites but even that was tenuous and the more general effect of the crusading armies in the Levant had been to make western Christianity detestable. Nevertheless, over the centuries sporadic overtures continued to be made by Rome. The results were seldom enduring. Gibbon described the representatives of the eastern Churches on whom union was briefly imposed after the Council of Florence in 1445 as 'unknown in the countries which they presumed to represent'¹ and, even if not always entirely accurate, such a description gives an idea of Rome's relationship with isolated groups or individuals who failed to have the Pope's conditions accepted by a majority of their co-religionists. Yet, as from the late sixteenth century and thanks to the commitment of Gregory XIII and his successors, the Church of Rome multiplied its efforts and its triumphs. In 1576 Gregory founded a Greek college in Rome and in 1584 a Maronite one. At the second synod of Brest-Litovsk in 1596 a union was concluded with the Ruthenian Churches and, unsuccessful though it was in the long run, the new Uniate Church was regarded as a threat to the other eastern Churches. Missionaries, above all Capuchins and Jesuits, were dispatched to the oriental communities and their proselytism was often remarkably effective.²

The Protestant approach differed fundamentally from that of the Catholics, for what the Protestants admired most about the Christians of the east was their sustained independence of Rome. Even if Luther was in two minds about the Greeks, Melancthon retained the greatest interest in them. One after the other, German scholars visited the Levant and returned with reports about the Greeks and their Christian neighbours. The works of Martin Crusius, David Chytraeus, Stephan Gerlach and Salomon Schweigger testify to the ecumenical aims of the Lutheran theologians in the sixteenth century and, particularly the writings of Schweigger, to the failure of the dream of a union between the non-Roman Churches.³ Although the Lutherans, like so many Protestants who visited the eastern Christians, became aware that the Greek Orthodox Church practised ceremonies and held beliefs which were far closer to Roman Catholicism than to Protestantism, their interest in the Christianity of the east continued. Throughout the seventeenth century, German princes encouraged expeditions to the Levant and members of the eastern Churches were made as welcome in Germany as in other parts of Europe.

A number of practices and beliefs continued to recommend the oriental Churches to the Protestants. Besides the rejection of Papal supremacy there was the marriage of priests, the denial of purgatory, the rejection of auricular

confession and extreme unction, the administration of the eucharist in both kinds, and the tendency to hold services in the vernacular. The synod of Brest-Litovsk and the missionary activity of the Jesuits meant, moreover, that the eastern communities, besides being persecuted by the Turks, were threatened by the Church of Rome. This brought about a protective attitude of Protestant churchmen who, even if they desired a union, were certainly determined never to impose one.

Interest in the eastern Churches inevitably led to the need for the improvement of knowledge. And for improvement there was room. If we except certain works on the Greek Orthodox Church, few of the accounts of the Arabic-speaking Christian communities in circulation by the early years of the seventeenth century were impartial, recent, or first-hand. Some of the most influential eye-witness reports dated from the thirteenth century. James of Vitry, one of the more popular authors, had been bishop of Acre before and during the Fifth Crusade. Two others, John of Piano Carpini and William of Rubroek, were dispatched a little later (the former in 1245, the latter in 1254) in order to enquire about the Mongols who, the western Church believed, might still be converted to Christianity. A similar enquiry prompted Burchard of Mount Syon to visit the Levant and to record his experiences in 1283. Writing when the myth of Prester John, the oriental Christian at the head of a vast army which would defeat the Muslims, was gaining in strength, these thirteenth-century travellers were optimistic and flattering about the Christian communities living in the east. According to Burchard, whose *Descriptio Terræ Sanctæ* was constantly reprinted in the sixteenth century, they far outnumbered the Muslims. They were meek and godfearing and often remarkably similar in their piety and their use of the Scriptures to their brethren in the west.⁴

Reports written in the thirteenth century bore little relationship to the state of affairs in the sixteenth century, even if the truly large quantity of Christians living under Ottoman rule again encouraged the idea of a Christian alliance to overthrow a Muslim overlord.⁵ Nevertheless the thirteenth-century texts were read avidly and included in the first volume of the 1598 edition of Hakluyt's *Principal Navigations*. Medieval in tone too was another influential work, the *Cosmographica Disciplina Compendium* of 1561 by the French Orientalist Guillaume Postel. Just as David Chytræus was to do some twenty years later, Postel emphasized the number of Christians living outside Europe who were 'hitherto unknown to us'. He recalled the prophecies of the pseudo-Methodius according to which a King of the Romans would recover Christ's kingdom from the west to the east and spread the Gospel from the summit of Mount Calvary. He reminded the Holy Roman Emperor Ferdinand I, to whom the work was dedicated, that the 'innumerable' Christians living in the Levant

would play an important part in the plan. But here Postel proved an exponent of the standard Catholic attitude—these Christians had lapsed sadly into error. They too needed to be converted. Above all, they needed to be educated. For that purpose Postel recommended circulating Arabic translations of the Gospels. Once this had been done, Postel had no doubt that the eastern Christians would recover their original piety and, in their turn, convert the Muslims.⁶

While medieval texts were being read and medieval myths refashioned, less fanciful contemporary eye-witnesses were composing reports which were heavily prejudiced. The French cosmographer André Thevet, who described the fauna of the Levant after a journey to the Holy Land in his *Cosmographie de Levant* of 1554, found that of all the creatures he encountered, the most bizarre and repugnant were the ministers of the Greek Orthodox Church who ‘take no account of the sacraments of the Catholic Church and have no reverence for them’. In Jerusalem he met other Christians, Armenians, Syrians, Nestorians and Jacobites. His opinion was no better of these ‘people who have always held fantastic views until this day, and have been blinded and enveloped in the darkness of error and ignorance.’⁷

The prevailing Catholic attitude was that, unless they accepted communion with Rome as the Maronites had, the eastern Christians were in error. Even the more objective Giovanni Botero, whose description of the eastern communities in the fourth part of his *Relationi universali* (1596) was a popular source, lamented ‘*gli errori della sua nazione*’ when discussing the Jacobites.⁸ Other widely read works were written with missionary zeal and the hope of imposing a union on the eastern Christians once they had shed their heresies. Such is the idea behind *De procuranda Salute omnium gentium* (Antwerp 1613) by the Spanish Carmelite Tomás de Jesús and the standard handbook on the Nestorians, Pietro Strozzi’s *De Dogmatibus Chaldaeorum Disputatio* (Rome 1617). The Maronites alone were singled out for praise, especially after their cordial reception of the legate Girolamo Dandini in 1596 and their adoption of the latinized Roman missal (to be followed, in 1606, by the acceptance of the Gregorian calendar). Dandini’s own report was not published until well into the seventeenth century but its content was known and was divulged by his fellow-Jesuit Antonio Possevino in his *Apparatus Sacer* of 1606.⁹

If, to these works, we add the various passages on the oriental Churches in Baronius’ *Annales*, we have the main sources used by the English in the early seventeenth century. While the 1598 edition of Hakluyt’s *Principal Voyages* included most of the medieval reports, the 1623 edition of its sequel, *Purchas His Pilgrimes*, contained sizeable excerpts from the works which had since become available.

ANGLICAN VIEWS

The English were slow to discover the eastern Christians. When they did so they were attracted by the idea of an ancient hierarchy in a national Church which could justify the existence of a national English Church. Two of the most prominent churchmen in the sixteenth century, Thomas Cranmer and John Jewel, had displayed a growing interest in the Greek liturgy,¹⁰ and investigation into the works of the eastern fathers was undertaken with particular industry beneath the protection of Lancelot Andrewes during his fellowship (since 1576), and his mastership (since 1589) at Pembroke Hall in Cambridge. His concern with the eastern Churches as well as his interest in Biblical studies prompted Andrewes to encourage the learning of Arabic and to patronize the man who did so much to introduce it into England: William Bedwell.

Bedwell matriculated at Trinity College, Cambridge in 1579, and became a scholar in 1584 and master of arts in 1588. While he was still at Cambridge Lancelot Andrewes imparted to him his plan of producing an Arabic-Latin lexicon and Bedwell set to work on the project which was to occupy him for the rest of his life, producing a specimen of some 800 pages by 1595. Among the first Arabic manuscripts he consulted were the works of those eastern fathers for whom Andrewes had such esteem—a selection of homilies by John Chrysostom and Ephraem's commentary on Genesis. It appears to have been largely on these texts that Bedwell based his opinion of the writings of the Arabic-speaking Christians.¹¹

The immediate purpose of Bedwell's praise of Christian works in Arabic was to seek patronage. In Andrewes he had a patron, but to subsidize the publication of Arabic books required more power and money than were initially in Andrewes' possession. Consequently he addressed others: Richard Bancroft, bishop of London, in 1603, and King James himself in 1604.¹² In his appeals he advanced many of the standard reasons for studying Arabic, but in his dedicatory epistle to the king, attached to his transcription and Latin translation of the Arabic version of the Epistles of St John, Bedwell seems to have touched for the first time on the theme of the Christian Arabs. On this he elaborated still further in 1606, in a preface to the Arabic version of the Epistles to Titus and Philemon. It was addressed to his original patron Lancelot Andrewes, recently appointed bishop of Chichester, who was to present Bedwell with the vicarage of Tottenham High Cross in the following year.

The writings of the Arabs (wrote Bedwell) say nothing about purgatory, about the impious sacrifice of the mass, about the primacy of Peter and his apostles,

about meritorious justification, and there is not a word about those other figments of the imagination. I call God to witness that in those prolix and elaborate commentaries on Genesis; those commonplaces, religious instructions and homilies circulated under the name of St Chrysostom about Joseph's peregrinations in Egypt, and many others read by me sedulously and with all the diligence of which I was capable, you will find nothing (if I am any judge of religious matters) that savours of Papism, Pelagianism, Arianism, Epicurianism, Mohammedanism or Judaism—nothing that savours of heresy. Here superstition, indeed suspicion, is far off.

With a few exceptions, Bedwell concluded, 'nearly all that I have seen, read, studied about religion is healthy and sincere, and clearly tallies with, and applauds, the Anglican, in other words the catholic, Church'.¹³

Bedwell, whose only experience of foreign countries was his journey to Holland subsidized by Lancelot Andrewes in 1612, had no direct knowledge of the Arab world. We may wonder to what extent his sources reflected the convictions of the Arabic-speaking Christians. His statements, moreover, remained in manuscript so there can be little question of any immediate influence on his contemporaries. They express, however, a persuasion widespread in a distinguished circle of English and foreign scholars, attracted by both the Anglican Church and the study of Arabic. At the same time Bedwell's words coincide with the beginning of an English interest in the eastern Christians which led to studies in comparative religion, to histories, and to expeditions to the Levant.

The scholars intrigued by Anglicanism—the Anglicanism of Richard Hooker and Lancelot Andrewes—had as a common objective the restoration of the ideal of a primitive Church with as few dogmatic points as possible. The more illustrious of these, the Dutch Arminian Hugo Grotius and the French Huguenot Isaac Casaubon, wished to organize a council of non-Roman Churches and thought of inviting the 'Churches of Greece and Asia'.¹⁴ Both men practised and encouraged the study of Arabic, and Casaubon was to become a close friend of Bedwell and Lancelot Andrewes after settling in England in 1610. For many members of this ecumenical circle the eastern Churches, independent, ancient and hierarchical, remained an ideal of which they had no direct experience. We shall now see that a closer acquaintance, based either on study or on personal visits originally stimulated by the same ideal, often led to disappointing conclusions.

The first important English expedition to the Levant in the years following the composition of Bedwell's dedicatory epistles was undertaken by George Sandys, the admirer of Grotius and the younger brother of Hooker's great friend Edwin Sandys. Indeed, one of the purposes of George's journey was to complete a plan which his brother had never been able to accomplish and

to acquire first-hand information about the eastern Churches with a view to a possible union. With the exception of the Greek Orthodox patriarch of Alexandria Cyril Lucaris, who was to have so many admirers in Protestant Europe, the Christians of the east impressed Sandys as unfavourably as they had the Catholic travellers of the previous century. Sandys' *Relation of a Journey begun An.Dom.1610* was first brought out by Bedwell's publisher Richard Field in 1615. It expressed to the full the author's distress at encountering the Copts 'infected with that heresie of one nature in Christ', the Abyssinians 'descended of the cursed generation of Chus', the Jacobites whose founder 'infected these countries with divers hereticall opinions', and the Maronites, 'an ignorant people, easily drawn to any religion, that could not give a reason for their owne: poor in substance, and few in number'. The degradation to which they had sunk was yet another instance of instability, allowing the reader to 'draw a right image of the frailtie of man, the mutabilitie of what so ever is worldly; and assurance that as there is nothing unchangeable saving God, so nothing stable but by his grace and protection'.¹⁵

Degradation, poverty and ignorance—these were the features which struck one English traveller after the other during his encounter with the eastern Christian communities. Charles Robson, on his way to take up his post as chaplain to the Levant Company in Aleppo in the late 1620s, had hardly recovered from the shock of seeing Roman Catholics in Leghorn when he discovered the Greek Orthodox in Myconos. 'They continue so poore by reason of the Turkes pillages, that unlesse they were merry Greekes indeed, any would wonder what delight they could take in living, living in continuall feare, in continuall and extreame necessitie'. Robson 'wondred at their ignorance and God's Iustice' and that 'scarce one of a hundred' could understand the Greek liturgy reminded him strongly of Roman Catholicism.¹⁶

Because of their ideological purpose the studies in comparative religion were more optimistic in their treatment of the eastern Christians, even if their degree of optimism varied. Edward Brerewood's *Enquiries touching the Diversity of Languages and Religions through the chiefe parts of the world* was edited by the author's nephew Robert and published posthumously by Bedwell's friend John Bill in 1614. Edward Brerewood had been above all a mathematician. He had been appointed in 1596 as the first professor of astronomy at Gresham College in London. A contemporary of Bedwell's, he had studied at Oxford, and his interest in the eastern Churches was connected with his antiquarian studies on the origins of episcopacy. In his preface Robert Brerewood explained some of the objectives of his uncle's work:

Lastly, whereas there are many christians in Greece, Asia, Muscovy, Aegypt and Aethiopia, it was desired of him that he would more distinctly set downe

the Countries wherein they lived, their superiours to whom they are subject, and their differences from the Romane Church, that it might more manifestly appeare, how idle are the common vaunts, amongst the ignorant of her amplitude, as though all the Christian world save a few Protestantes shut up in some obscure corner of Europe, professed the same faith she embraceth and were within the territories of her Jurisdiction. The falsehood of which glorious boastings are in part most lively discovered in this learned Tractate, describing the divers conditions of Christians in the East, North and Southerne Regione of the earth which have no subordination unto the Papall Hierarchie.¹⁷

Despite such an apparently benevolent aim, with its echoes of Postel's *Cosmographia*, Edward Brerewood's book, which was reprinted regularly until 1674, was by no means sympathetic to the original beliefs of the eastern Christians. After listing the traditional errors of the Maronites (which he derived from Possevino and Tomás de Jesús) he went on to deplore 'this heresie of the Monothelites, springing out of that bitter roote of the Iacobites, touching one onely nature in Christ'. Yet Brerewood saw that there was hope. Purified by suffering, the oriental communities were on their way to discovering the true religion:

So on the other side having now at length their harts humbled, and their wits tamed by that povertie and affliction, wherein the tyrannie and oppression of the Arabians and Turkes hath long holden them, it seemeth that the Lord hath taken pitie on them (as it is his propertie not to dispise humble and broken spirits, and to remember mercie in the midst of iudgement) and reduced them, or the most of them, to the right acknowledgement of his sonne againe. For certainly, that they [the Maronites] and other Christians of the East, have (at least in these later times) disclaimed and abandoned, those hereticall phantasies touching our Saviour, wherein by their misleaders they had been aunciently plunged (and which many Christians of these West parts, still charge them with all) doth manifestly appear . . .¹⁸

The confessions of faith which Brerewood then listed (by the Jacobites, the Nestorians, the Armenians, the Copts of Egypt, the Abyssinians and the Maronites) had mainly been drawn up in order to please the Church of Rome and Brerewood's acknowledgement of the improvement of the eastern Churches could be regarded as a tribute to Catholic missionary activity. This, however, was far from his purpose. It is clear from his nephew's preface that he, like Grotius and Casaubon, cherished the ideal of 'a most sacred harmony betweene [the non-Roman Churches] in the more substantiall points of Christian Religion necessary to, salvation'.¹⁹

Brerewood's disapproval of the 'heresies' of the east was shared by the author of another similar work, Alexander Ross, former chaplain to Charles I, whose *Pansebeia, or a View of all Religions in the World*, appeared in 1653. Yet there was one book in which the delight in the eastern Christians' refusal

to submit to Rome is such that their anomalous beliefs are excused, if not actually praised. This is *Christianographie, or The Description of the multitude and sundry sects of Christians in the World not subject to the Pope. With their Unitie, and how they agree with us in the principal points of Difference betweene us and the Church of Rome*, written by Ephraim Pagitt. It was published in 1635, well before Pagitt's later conversion to Presbyterianism, and composed while he was still a protégé of that great High Church patron of Arabic studies, Archbishop Laud. On the face of it Pagitt's aim was the same as Brerewood's. 'That which I intend in this treatise', he wrote, 'is, to shew that there are many Christian Churches as well in Europe as in other parts of the world, that do not adhere to the Roman Church, nor acknowledge the Pope for their head'.²⁰ Just as Brerewood's study of the origins of episcopacy had led him to conclude that England had always had an episcopacy of its own which was completely independent of Rome, so Pagitt stressed the points of community between the independent Churches of the east and the independent Christianity of the ancient Britons. Unlike Brerewood Pagitt was incensed by the Catholic assumption that the oriental Christians were in error. They deserved, rather, our prayers and sympathy.

Many of these Christians live under the Turke, and Pagans, and suffer very much for Iesus Christs sake which they might quit themselves of, if they would renounce their religion, and also might enjoy many immunities, and privileges, which they are for their religion only deprived of as before. The lamentable Calamities of these afflicted and distressed Churches, should cause all true harted Christians, in true sence and compassion of their miseries, to make their prayers, and humble petitions to Almighty God, to cast downe his pitifull eyes upon them: And farre be it from us to beleeve that all these Christians are excluded heaven, and plunged into hell for not submitting themselves onely to the Bishop of Rome.²¹

While Brerewood, Ross and Pagitt wrote about the eastern Churches in general an interest matured in one of these Churches in particular, the Coptic Church. The process seems to start with the remarkably enthusiastic welcome accorded in 1610 to Yūsuf ibn Abū Dhaqān, also known as Josephus Barbatus or Abudacnus. Abudacnus was a Copt from Cairo who arrived in Rome with a letter for the Pope, Clement VIII, from the patriarch of Alexandria in 1595. In Rome he converted to Catholicism. He then made his way to Paris, where he gave Arabic lessons, acted as interpreter at court and to the French ambassador to Morocco, and entered that international circle of Arabists which extended over Europe. He met Isaac Casaubon and two other French Arabists, Etienne Hubert and Jean Martin. He gave lessons to the young Dutch Arabist Thomas Erpenius. He wrote to Joseph Justus Scaliger in Leiden, endeavouring to solicit an invitation to the Low Countries. From

Erpenius he obtained a letter of introduction to William Bedwell in London. The extent of Abudacnus' education and knowledge is difficult to fathom. Judging from his surviving letters his Arabic was not of the best and his Latin was poor. Yet he had a smattering of a great many languages: Hebrew, Syriac, ancient and modern Greek, Turkish, French and Italian, to which he later added Spanish and English. With this smattering he went a long way, publishing a work on Hebrew grammar, and leaving in manuscript various translations into Arabic, a study on the Copts, and an Arabic grammar.

Abudacnus arrived in England in the summer of 1610. He was recommended by Richard Bancroft, archbishop of Canterbury, to the vice-chancellor of Oxford university, John King, bishop of London, and he was praised in a warm letter by Thomas Bodley to his librarian William James. At Oxford he seems to have lectured briefly in Arabic, and to have transcribed at least one Arabic manuscript, presumably in Bodley's library. In London, where he was awaited by William Bedwell and Lancelot Andrewes, he met Miles Smith, future bishop of Gloucester, and saw his old acquaintance Isaac Casaubon. Abudacnus remained in England until 1613 when, with letters from the Archduke Albert's ambassador Ferdinand de Boisschot, he went to the Southern Netherlands and taught Arabic and Hebrew. Protected by the Archduke, whom he once served as interpreter, he subsequently lectured at the university of Louvain until he was ousted by his hostile colleagues. In 1618 he went to Bavaria where the distinction of his friends and patrons would seem to confirm the widely benevolent attitude towards the eastern Christians in both Catholic and Protestant Europe. Laden with further recommendations, he made his way to Austria, to Linz and then to Vienna. With the backing of the imperial librarian, Sebastian Tengenagel, he was appointed dragoman in Constantinople, a post he retained for over twenty years.²²

It may very well have been in Oxford that Abudacnus, finding someone prepared to correct his Latin, wrote his brief work on the Copts. It remained in manuscript for some sixty-five years until it fell into the hands of a member of the circle of Edmund Castell—Thomas Marshall, one of a number of scholars who had spent the period of the Commonwealth in disgrace or in exile and returned to England after the Restoration to take up a high academic post. After holding a Trappes scholarship at Lincoln College, Marshall had fled from Oxford to Holland with the arrest of Charles I in 1647, and had become chaplain to the Company of Merchant Adventurers. Residing first in Rotterdam and then in Dordrecht he had encountered the younger Franciscus Junius, Isaac Vossius, and the greatest Arabist of his day Jacob Golius, all of whom seem to have encouraged his interest in Coptic and in the Copts of Egypt. Elected to a fellowship at Lincoln College in 1668 he returned to England

shortly after and was made rector of the college in 1672.²³ Then, in 1675, he edited Abudacnus' *Historia Jacobitarum, Seu Coptorum, in Ægypto, Lybia, Nubia, Æthiopia tota, et in parte Cypri insulæ habitantium*. In his preface he said that it was soon to be followed by an edition of the Coptic Gospels. When he was still in Dordrecht in 1669, he had written to his friend Thomas Smith, recently appointed chaplain to the English ambassador in Constantinople, that

the first attempts in this obsolete literature must be a small wedge to make way for greater; I mean the rest of the Aegyptian Christian Monuments which are found in Italy or elsewhere. Nay, I think it may be used for a small bait to fish in the Nile withall... I should gladly see, Oxford Theatre bring forth the first fruits of that anciently famous Christian Church in Aegypt rather than any other place I know.²⁴

Thomas Marshall never managed to achieve his ambition of producing an edition of the Gospels in Coptic. Abudacnus' book was a very small bait, short and superficial—'slight', as Gibbon was to describe it in the following century.²⁵ Nevertheless it was translated into English²⁶ in 1692 and was reedited twice in the eighteenth century.²⁷ Its fortunes are surprising in view of the appearance of a far more scholarly and informed study on the subject written while Marshall was preparing his edition: the *Histoire de l' église d'Alexandrie*, first published in French in 1677 by the German Johann Michael Wansleben. Because of his knowledge of Ethiopic, Wansleben had worked with Edmund Castell on his *Lexicon Heptaglotton*. His book on the Copts, an English version of which, *The Present State of Egypt*, appeared in 1678, was the result of an expedition to the Levant undertaken on the orders of Louis XIV's minister Colbert. It was a work of considerable stature, based on some of the most important Arabic sources and rendering Abudacnus' booklet all but entirely useless.²⁸ In contrast to Abudacnus' booklet, it emphasized the points of community between the Copts and the Roman Catholics. Abudacnus' study remains unique largely because it was written by a Copt and was originally composed well before Wansleben.

ISAAC BASIRE AND THE ALEPPO CHAPLAINS

We now turn to a group of Englishmen who spent longer periods of time in the east, daily encountered the Christian communities and, in one way or another, tried to propagate the Anglican faith. The most dedicated was Isaac Basire, of French origin and by no means an Arabist. Formerly chaplain to Charles I, Basire was forced abroad, like Thomas Marshall, during the Commonwealth. After travelling through France and Italy, he decided that his mission was to

spread Anglicanism in the Ottoman Empire. He accordingly departed for the Levant. In 1653 he wrote an epistle from Constantinople sustaining Britain's age-old independence of Rome with a patriarchate of its own (much in the style of Pagitt) and relating his efforts to distribute the Anglican catechism in Greek, Turkish and Arabic translations. He had been, he reported, particularly successful in Zante 'spreading amongst the Greeks the Catholic Doctrine of our Church'. He went on to Syria 'where, after some months' stay in Aleppo, where I had frequent conversation with the Patriarch of Antioch, then resident there, I left a copy of our Catechism translated into Arabick'. Yet he encountered considerable opposition among the 'Latins', or the Catholic missionaries and their Uniate supporters. They threatened to inform the Turks about his activities and to have the patriarch put an end to them. They even threatened to murder him on his return from one of the Greek Orthodox churches. Undeterred, Basire proceeded to Jerusalem where he 'received much honor, both from the Greeks and Latins', and penetrated as far as Mesopotamia. After his success in the Middle East he proposed a communion with the Greek Orthodox Church and announced his intention (which he never accomplished) of pursuing his travels to Egypt in order to visit the Copts.²⁹

The other Anglicans in the Levant were less single-minded than Basire. These were the chaplains to the Aleppo factory of the Levant Company. However great their piety, their interest in the east went far beyond the objective of propagating Anglicanism. As scholars, and often as Arabists, they studied the language, the people and the culture and made of Aleppo England's most vital link with Arab civilisation in the seventeenth century.

Largely on account of its importance for the silk trade, Aleppo was one of the main commercial centres in the east. A factory had been established there in 1583, two years after the foundation of the Levant Company. By 1586 there was an English consul and, within about ten years (the exact date is unknown), there appears to have been a chaplain. The factory was lodged in the Khan al-Gumruk, one of the largest and finest caravanserais in the town which had been built in 1574 south of the Great Mosque. For much of the seventeenth century the English shared the khan with the Dutch and the French, but the two other consulates subsequently moved to premises of their own.³⁰

In the seventeenth century the election of the chaplain was undertaken by the general court of the Company in London, usually after the candidates had preached a sermon before the assembly. Where the Aleppo factory was concerned, there seems to have been a preference for men educated at Oxford. This was in contrast to Smyrna, where a majority of the chaplains had been to Cambridge, and to Constantinople, where the two universities were equally

represented. With a single exception all the Aleppo chaplains had studied at Oxford. Charles Robson had been at Queen's, Edward Pococke and Robert Frampton at Corpus Christi, Robert Huntingon at Merton, and Henry Maundrell at Exeter College. Until the middle of the century the salary was £50 per annum besides a sum towards expenses, but this increased in the 1650s. The chaplains, who normally remained bachelors, often indulged in trade themselves, but their main function was to hold religious services in the consular chapel for the benefit of the employees of the factory. The number of merchants present increased steadily from about fourteen in 1596 to over fifty in the 1660s, and we know that when Robert Frampton, the future bishop of Gloucester, preached between 1655 and 1667, the English merchants were joined by other western Christians, especially by German Lutherans. This suggests a tolerant and latitudinarian attitude not uncommon in other factories, as we know from the case of Smyrna.³¹

Frampton left his mark on the Aleppo factory, as we see from the description by Henry Maundrell, himself appointed chaplain in 1695:

... such they still continue, as that incomparable Instructor left them: That is, Pious, Sober, Benevolent, devout in the Offices of Religion: in Conversation, innocently cheerful; given to no pleasures but such as are honest and manly; to no Communications, but such as the nicest Ears need not be offended at; exhibiting in all their Actions those best and truest signs of a Christian Spirit, a sincere and cheerful friendship among themselves, a generous Charity toward others, and a profound reverence for the Liturgy and Constitution of the Church of England. It is our first Employment every morning to solemnize the dayly Service of the Church; at which I am sure to have always a devout, a regular and full Congregation. . .³²

Maundrell's is not the only description of the atmosphere at the Aleppo factory. Some years earlier, in 1676, the naval chaplain Henry Teonge went on a picnic with the forty or so Englishmen just outside the city 'where a princely tent was pitched; and wee had severall pastimes and sports, as duck-hunting, fishing, shooting, handball, krickett, scrofilo; and then a noble dinner brought thither with great plenty of all sorts of wines, punch, and lemonads.'³³

Although Edward Pococke considered Aleppo a 'very melancholy place' it was attractive for students of Arabic. The town was regarded as the friendliest in the Arab world. Robert Frampton was so taken by it that he returned voluntarily after his marriage to minister to victims of the plague. Charles Robson, after an exhausting and dangerous journey from Alexandretta, found 'my welcome exceeding my hopes' and Teonge added to his description of how a young Englishman had been seduced by the wife of a local official: 'And this shews they love the English'.³⁴

The Aleppo chaplains tended to acquire a sound knowledge of Arabic. Edward Pococke, chaplain from 1630 to 1636, had studied the language when he was still at Oxford under Matthias Pasor and had subsequently turned to William Bedwell. Not only did Bedwell give him tuition, but he also put him in touch with his future patron, William Laud, then bishop of London, who first wrote to him when he was in Aleppo in 1631. Only in Aleppo, however, did Pococke truly master Arabic. Besides improving his Hebrew and his Syriac and learning Ethiopic, Pococke arranged for a learned Muslim to give him regular lessons in classical Arabic and employed a Muslim servant with whom to practise the spoken language. With active practice and constant reading and translating Arabic texts he soon spoke it 'with as much ease as his mother-tongue, and so well understood the criticism and niceties of it, that his sheich pronounced him a master in it, in no sort inferior to the mufti of Aleppo'.³⁵ Robert Frampton was also noted for his fluency. He used to describe the scepticism of his servant who observed him at work with his Arabic grammar. He consequently cast it away and 'being master of their alphabet, came soon to read, but found observation the readiest way to an ability of converse'.³⁶

The factory of the Levant Company in Aleppo was conducive to study. It had a sizeable library, containing 228 volumes in 1688, and the chaplains had ample time to devote to research, to exploration and to collecting manuscripts and other antiquities.³⁷ Some of the first English collections of Arabic and Syriac manuscripts were made by men who had worked at Aleppo: by Paul Pindar, consul in Aleppo from 1606 to 1610 before being appointed ambassador to Constantinople, and by the chaplains, Robson, Pococke, Frampton and, above all, Robert Huntington.

Henry Maundrell, chaplain from 1695 to 1701, travelled. He intended his *Journey from Aleppo to Jerusalem At Easter AD 1697* to be a supplement to Sandys' work. His remarks on the eastern Christians were accompanied by observations on the landscape, the architecture and the archeology. Robert Huntington who was chaplain from 1670 to 1681, also travelled south, assembled an impressive collection of manuscripts, and pursued his investigations into the Samaritans. Frampton compiled a collection of Arabic proverbs 'with an account of their original and present use and application, with a parallel of the European in various languages'.³⁸ But of all the scholarly chaplains Edward Pococke was the most versatile. Besides translating al-Maydānī's collection of six thousand proverbs, he studied the habits of the chameleon, confuting Pliny's assertion that it could do without food. He also profited from his years in Aleppo to continue his Biblical studies. Fascinated by the entire area in which the Old Testament had been composed, he reached

a number of currently accepted conclusions about the meaning and translation of certain words and passages by observing local customs. He thus understood the exact significance of the image of thrashing corn, performed in a way and with an instrument unknown in Europe. He also concluded that *tannim* in Ps.44:19 and *shualim* in Ps.63:10 were neither 'dragons' nor 'foxes', as they had respectively been translated, but the jackals he heard calling in the Aleppo nights.³⁹

Among the most striking features of Aleppo was its international quality—'an Epitome of the whole world',⁴⁰ as Robson described it—and its large communities of Christians. The Christians with whom the English merchants and their chaplains had most to do were the Greek Orthodox. These they employed as servants, used as interpreters, and sometimes took as wives. Yet it was not only members of the Greek Orthodox Church who assisted the English scholars in their research and, above all, in their quest for manuscripts. Frampton received one of his most treasured manuscripts, a *Qur'ān*, from the Armenian Uniate bishop Dawūd and included numerous other Christians among his friends.⁴¹ Huntington was in learned correspondence with Johannes Lascaris, the Greek Orthodox archbishop of Mount Sinai, with Hilarion Cigala, Orthodox primate of Cyprus, and above all with the Maronite patriarch of Antioch, Estefan al-Duwayhī.⁴²

In these circles the chaplains attempted to propagate the Anglican faith. The most intense campaign was undertaken by Pococke in collaboration with Huntington. Besides a learned Muslim intermediary in the acquisition of manuscripts, Aḥmad, Pococke had already made use in Aleppo of the services as a copyist of Thaljah, the brother of the Greek Orthodox patriarch of Antioch. He had met Cyril Lucaris, by then Orthodox patriarch of Constantinople, when he returned to the Levant in 1637 and acted as chaplain at the English embassy in Constantinople. On his way back to England in 1640 he stopped in Paris where he encountered Grotius and the Maronite scholar Gabriel Sionite.⁴³ His first missionary effort was made together with Robert Boyle and was intended to introduce the Muslims to Christianity. This was the translation into Arabic in 1659, at Boyle's request and expense, of Grotius' *De veritate religionis christianæ*. Boyle went on to subsidize Seaman's translation into Turkish of the New Testament and the Anglican catechism in 1666 and, through his interest in the eastern Christians, was exposed to the imposture of a man posing as a patriarch of Antioch.⁴⁴

Pococke published his translation into Arabic of the Anglican catechism 'for the use of the young Christians in the East' in 1671 and dispatched 36 copies, together with copies of his translation of Grotius, to Huntington in Aleppo. Huntington distributed the books among his Christian acquaintances

and urged Pococke to translate into Arabic the Anglican liturgy, offering £20 towards the expenses. His arguments for doing so included 'the need that the Greek Christians have of devotional books; their esteem for the Church of England above all others; their agreement with it in doctrine, excepting the points of the procession of the Holy Ghost and Transubstantiation.'⁴⁵ Although it was not Huntington but Oxford University that finally subsidized *Partes Præcipuæ Liturgiæ Ecclesiæ Anglicanæ* in Arabic, when copies arrived in 1675 Huntington again gave them to Christians such as the archbishop of Mount Sinai, to whom he recommended the Anglican Church.⁴⁶

MYTH AND REALITY

To what extent did the western view of the eastern Christians correspond to reality? In the west they were regarded as the victims of continuous persecution and for this reason, even in their degradation, they deserved sympathy. At the same time it was widely felt that they were eager to join the western Churches which had so much to offer—above all money and education, but also doctrine. Was this simply an illusion, or was there an element of truth in it?

First, let us take the conditions in which the Christians lived under Turkish rule. Certainly those oriental Christians living in the west were vociferous in their complaints, and few more so than the Greeks. In England one of the best examples is Christopher Angelos. His account, *Christopher Angell, A Grecian, who tasted of many stripes and torments inflicted by the Turkes for the faith which he had in Christ Iesu*, was published in Oxford, in Greek in 1617 and in English in 1618. The detailed description of how the author was flogged by the Turks in their efforts to force him to recant was accompanied by woodcuts illustrating his treatment. But Angelos was not altogether disinterested. He was staying in England and needed money to survive. His book was the medium by which he hoped to win the sympathy and generosity of his English patrons.⁴⁷ The complaints from the Arabic-speaking Christians, whose communities had been accustomed to Muslim rule for longer than the Orthodox in Greece, tended to be less specific. In his correspondence with Pope Paul V in the early seventeenth century the Nestorian patriarch of Babylon wrote that he could not come to Rome himself 'since our oppressive rulers do not allow me to do so. Nor do they let me go to Jerusalem. They keep us like slaves and do not allow us to do what we want.'⁴⁸ Similarly the Maronite patriarch al-Duwayhi wrote to Huntington that 'this garden which was once so fine and magnificent is now all the more desolate and down-trodden since, for about a thousand years, it has been under the tyrannic yoke

of the Infidel.’⁴⁹

Certainly the Christians of the Ottoman empire had fewer rights than the Muslim subjects. They were second-class citizens. What rights they had were by no means always respected. Episodes like the flogging of Christopher Angelos could occur, and the most painful aspect of Ottoman rule was its unpredictability. The eastern Churches, moreover, were poor, and the poverty, aggravated by taxation, produced the ignorance which shocked western travellers. This was one of the reasons for the success of the well-educated and well-organized Roman Catholic missionaries. But if there was little liking among the oriental Christians for the Ottoman rulers, there was not always much more for the Christians of the west. Although it had occurred some centuries previously the last encounter between the Christians of the east and west had been catastrophic: the arrival of the crusaders who dealt arrogantly with their heretical eastern brethren, and, worse still, prejudiced their position, putting an end to the traditional tolerance with which they had been treated by the Muslims. Nor were the western Christians necessarily better in the seventeenth century. The Greek Orthodox community of Chios found its Church handled with more respect by the Turks than by the Venetians who occupied the island in 1694.⁵⁰ From the Turks, at least, the eastern Christians had no inquisition to fear. They were, on the whole, free to believe what they pleased. If we look at the few oriental sources, partial indeed, but written for an eastern rather than a western readership, we see that the lamentations about the Turks go little further than a habitual complaint about taxes. The chronicles composed by al-Duwayhi is instructive. There we see clearly who the true enemies of the Maronites were—not the Turks, so abominated for the benefit of western readers, but the other eastern Christian communities, and above all the Greek Orthodox, always ready to manoeuvre the Ottoman officials against fellow Christians of a different persuasion.⁵¹ ‘In faction I noted them so desperate malicious towards one another,’ wrote Henry Blount, disgusted by the Christians during his visit to the east in 1634, ‘as each loves the Turke better then they doe each of the other, and serve him for informers and instruments against one another.’ This judgement was fully confirmed over a century later by the Scottish physicians of the Levant Company, the Russell brothers. ‘The hardships they sometimes complain of suffering on account of religion’, they wrote of the Christians in *The Natural History of Aleppo*, ‘are always the consequence of intestine feuds among themselves; for the Turks never interfere, till incited or solicited by one or other of the parties’.⁵²

Yet the west did have something to offer the Christians of the east. It had money. Refugees and visitors benefited from the generosity of western

governments.⁵³ It could provide education—academies and printing presses. Finally, certain western embassies in Constantinople could help to protect certain Christian communities. The most powerful embassy was usually that of Catholic France, and the ambassadors generally preferred Catholic Uniates to others. For some years after 1620, the ambassadors of England and Holland could also be useful allies. In this period we find members of the Greek church looking with particular interest to Protestant Europe. Yet those Greek Orthodox churchmen who displayed a benevolent attitude towards Protestantism had more at heart the autonomy of the Orthodox Church from Rome, threatened as this seemed to be by the synod of Brest-Litovsk and the missionary advance, than a union with the Protestants. If, like Cyril Lucaris, they introduced too many Protestant tenets into their teaching, they were disowned by the other members of their Church.⁵⁴

There is hardly any surviving evidence of the effect of the English attempt to propagate Anglicanism in the Levant. A letter written in the late 1730s by a Jesuit missionary in Aleppo is prejudiced, but there is little else.

The Gentlemen of the so-called reformed Religion would not dare to dogmatize here. Or at least, they would not do so with impunity. Some time ago an English minister, zealous for his sect, had printed at great expense a catechism after his own fashion: he hoped to instil into the spirit and heart of all the Christians the poison with which it was filled. But it was trampled under foot; it was torn; it was burnt, without the Missionaries' having to make the slightest gesture. The Christians of all the nations of the Orient know not what it means to doubt the reality of the body of Jesus Christ in the Eucharist; and they are all so devoted to their fasts and their Lents that they would rather die than renounce them. They have also received from Antioch, their neighbour and their mistress in the Faith, the habit of praying for the dead. The invocation of the Saints, and particularly of St George, is so dear to them and so precious that they would have themselves cut to pieces rather than give it up. Nor can one add anything to the deep veneration which even the Turks have for Mary: they call her the Mother of the great Prophet Jesus, and venerate her in this capacity to the point of impaling the Jews who dare to blaspheme against her. What a strange contrast! Men born in the cradle of Christendom refuse to Mary honours and thus become the most implacable enemies of the Christian name.⁵⁵

The English minister referred to may well have been Robert Huntington and the reactions recorded by the Jesuit were illustrative of the amenability of the eastern Christians. This same amenability led the Anglicans to believe they shared certain points with the Greek Orthodox and prompted those studies of the Church in the last decades of the seventeenth century which enable us to chart the growing disenchantment.

Thomas Marshall's friend Thomas Smith, chaplain to the English embassy in Constantinople from 1669 to 1670, was still optimistic about the Greeks in his *Account of the Greek Church, as to Its Doctrine and Rites of Worship*,

published in Latin in 1676 and in English in 1680. He encouraged the plan to build a Greek church in London

to relieve the necessities of those, whom either curiosity and love of learning shall draw into these parts, or Turkish cruelty and persecution shall drive and force out of their own Country; and at the same time to reduce them from those errors and corruptions, which have of late crept in among them, by bringing them into a nearer and more familiar acquaintance with the Doctrin, and rites of Worship establisht in the Church of England.

He deplored 'the sly artifices and insinuations and underhand dealing of the subtle Emissaries of Rome, who watch continually over the poor Greeks, and take advantage of their poverty and distress to bring them to a further compliance, and in time, to a down-right subjection', and exclaimed: 'What a Glorious design would it be, and how much for the honour of our Religion, if the Christian Princes would unite and enter upon a Holy War, and redeem the Oriental Christians from the burthen of this intolerable tyranny and slavery!'⁵⁶

Sir Paul Rycaut had been secretary at the embassy in Constantinople from 1661 to 1666 and subsequently consul in Smyrna until 1678. He published his *Present State of the Greek and Armenian Churches, Anno Christi 1678* in 1679. Despite a generally sympathetic attitude to what he encountered in the Levant, he was distressed by the state of the Greek Orthodox Church, the penury and ignorance of its ministers and the indifference of its members. Such, too, was the reaction of Henry Maundrell to the Greek Orthodox he met in Syria and the Lebanon. It was this disappointment, rather than the optimism of Pagitt or even of Thomas Smith, which culminated in the work of another former chaplain to the embassy in Constantinople. John Covel's *Some Account of the Present Greek Church, with Reflections on their Present Doctrine and Discipline; Particularly in the Eucharist, And the Rest of their Seven Pretended Sacraments* was published in 1722, the year of the author's death. Covel concentrated on a subject about which the Greeks were deliberately vague, transubstantiation. He thereby brought out one of the main differences in mentality between west and east: the western need for clear definitions of dogmatic points with which the eastern Christians were not particularly concerned.

Covel's insistence on dogmatic definitions was a far cry from the conciliatory ideals of Grotius and Casaubon. His book coincided with the last attempt for many years to form a union with the Churches of the east. This attempt was made in the small community of non-jurors, those Anglicans who believed that the 'catholicity' of the Church of England had been betrayed by the revolution of 1688. They continued to uphold, as Thomas Ken, former

bishop of Bath and Wells, wrote in his will, 'the holy and apostolic faith professed by the whole Church before the division of East and West'. Between 1716 and 1725 a group of non-jurors endeavoured to negotiate with the Greeks and the Russians until the archbishop of Canterbury informed the patriarch of Jerusalem that they were impostors who did not represent the English Church.⁵⁷ Despite such failures, however, the attitude even behind the approaches of the non-jurors foreshadows the commendably disinterested approach of the Church of England in more recent times. In the nineteenth century missionaries were dispatched to the east in order to help and advise the Christian communities about reforming their own Churches.⁵⁸ The object was assistance rather than conversion, and one of the most active figures behind these endeavours, the topographer George Williams, consciously placed himself in a tradition that went back to Lancelot Andrewes.⁵⁹

CONCLUSIONS

In England what was originally a Protestant attitude to the Arabic-speaking Christians soon became a specifically Anglican one. Admittedly the study of the eastern Churches could lead in various directions, and we find the puritan archbishop George Abbot inviting Cyril Lucaris to send young Greeks to England to study theology at the king's expense. Slightly later John Selden, in a controversial edition published in 1642, exploited the works of the tenth-century Melchite patriarch of Alexandria, Eutychius, in order to discredit the alleged antiquity of the institution of episcopacy.⁶⁰ On the whole, however, it was supporters of episcopacy who were interested in the oriental Churches with their ancient hierarchies. William Bedwell, the High Churchman, the friend and protégé of so many Arminians both in Holland and England, illustrates a tendency that was to prevail. It was thus mainly Laudian Anglicans and royalists, such as Pococke, Marshall, and Basire, rather than Puritans and parliamentarians; non-jurors like Frampton and Ken rather than Whigs, who took an interest in the eastern Churches and, more generally, in Arabic studies.

Despite the Anglican interest in the eastern communities, England never profited from the presence of Arabic-speaking Christians in the way that France or the Vatican did. Abudacnus' brief visit to Oxford and London cannot be compared to the long and fruitful years spent by the Maronites Gabriel Sionite and John Hesronite in Paris or by Abraham Ecchellensis in both Italy and France in the seventeenth century, or to those spent by the various members of the Assemani family in Rome in the eighteenth century. With the exception of the studies on the Greek Orthodox Church, the works

of Smith, Rycaut and Covel, the English produced no work on the eastern Christians to compare with the books by Wansleben and Renaudot on the Copts. Nevertheless the Christian communities of the east continued to attract Arabists throughout the seventeenth century. Their poverty, their ignorance, even their observances drew criticism, but their presence stimulated Arabists to explore the Levant and when they did so they found the Christians to be valuable allies.

NOTES

¹ Edward Gibbon, *The Decline and Fall of the Roman Empire*, Modern Library Edition, 3 vols. (New York 1932), III, p. 712.

² For a survey of the development of uniatism see Charles A. Frazee, *Catholics and Sultans. The Church and the Ottoman Empire 1453-1923* (Cambridge, 1983), pp. 5-220.

³ The development is discussed in Ernst Benz, *Die Ostkirche im Lichte der Protestantischen Geschichtsschreibung von der Reformation bis zur Gegenwart* (Munich, 1952), pp. 3-61; Steven Runciman, *The Great Church in Captivity* (Cambridge, 1968), pp. 238-58.

⁴ On the thirteenth-century expeditions to the Levant see R. W. Southern, *Western Views of Islam in the Middle Ages*, 2nd edn. (Cambridge, Mass., 1978), pp. 47-66. For the use of these medieval reports in the sixteenth century, see Alastair Hamilton, *William Bedwell the Arabist 1563-1632* (Leiden 1985), pp. 78-9.

⁵ Such was the proposal of Henri IV's ambassador in Constantinople François Savary de Brèves. See his *Discours abrégé des asseurez moyens d'aneantir et ruiner la Monarchie des Princes Ottomans in Relation des Voyages de Monsieur de Brèves* (Paris, 1628), p. 36. For Savary de Brèves and his Maronite assistants in Paris, see Gérald Duverrier, 'Les débuts de la typographie orientale. Les caractères de Savary de Brèves et la présence française au Levant au XVII^e siècle', *L'Art du Livre à l'Imprimerie Nationale*, (Paris, 1973), pp. 69-87; *idem*, 'Les impressions orientales en Europe et le Liban', *Le livre et le Liban* (Paris 1982), p. 157-89.

⁶ Guillaume Postel, *Cosmographicae Disciplinæ Compendium* (Basel, 1561), sig. A4v., pp. 63, 74-8.

⁷ André Thevet, *Cosmographie de Levant*, (Lyon, 1554), pp. 96, 171.

⁸ Giovanni Botero, *Relationi universali* (Venice, 1595), fol. 65r.

⁹ Antonio Possevino, *Apparatus Sacer*, 2 vols. (Venice, 1606), II, pp. 396-9. Dandini's report was first published fifty years later: *Missione Apostolica al Patriarca e Maroniti del Monte Libano del P. Girolamo Dandini* (Cesena, 1656).

¹⁰ For the interest in the Greek liturgy shown by Cranmer, Jewel, and above all by Lancelot Andrewes' disciple John Cosin, see G. J. Cuming, 'Eastern Liturgies and Anglican Divines 1510-1662' in *The Orthodox Churches and the West*, ed. Derek Baker, Studies in Church History, 13 (Oxford, 1976), pp. 231-8. The later influence of eastern liturgies is discussed by W. Jardine Grisbrooke, *Anglican Liturgies of the Seventeenth and Eighteenth Centuries* (London, 1958).

¹¹ See Hamilton, *William Bedwell the Arabist*, pp. 9-12.

¹² Bedwell's dedicatory epistles are published *ibid.*, pp. 106-20.

¹³ *Ibid.*, p. 117. The original preface is in Ms Slo.1796, fols. 1r-26v, British Library, London.

¹⁴ *Briefwisseling van Hugo Grotius*, ed. P. C. Molhuysen (The Hague, 1928), I, p. 193. Casaubon commended Possevino's *Apparatus Sacer* in his diary on account of

the information it contained on the Maronites. See Isaac Casaubon, *Ephemerides*, 2 vols. (Oxford 1850), II, pp. 777. On the movement as a whole see Hugh Trevor-Roper, 'The Church of England and the Greek Church in the Time of Charles I', *Religious Motivations and Social Problems for the Church Historians*, ed. Derek Baker, *Studies in Church History* 15 (Oxford, 1978), pp. 213-40.

¹⁵ George Sandys, *A Relation of a Journey begun An.Dom.1610*, (London, 1627), sig. A2v., pp. 110, 170, 172.

¹⁶ Charles Robson, *Newes from Aleppo* (London, 1628), pp. 3, 9-10.

¹⁷ Edward Brerewood, *Enquiries touching the Diversity of Languages and Religions through the chiefe parts of the world* (London, 1622), sig. ** 2r.

¹⁸ *Ibid.*, pp. 180, 183.

¹⁹ *Ibid.*, sig. ** 4r.

²⁰ Ephraim Pagitt, *Christianographie*, 3rd edn. (London, 1636), sig. b3v.

²¹ *Ibid.*, p. 175.

²² On Abudacnus, see G. Graf, *Geschichte der christlichen arabischen Literatur*. 4 vols. (Città del Vaticano, 1944-53), IV, pp. 131-3; Hamilton, William Bedwell the Arabist, pp. 34-7; Peter Meienberger, *Johann Rudolf Schmid zum Schwarzenhorn als kaiserlicher Resident in Konstantinopel in den Jahren 1629-1643* (Bern-Frankfurt a.M., 1973), pp. 94-95.

²³ For Thomas Marshall, see Vivian Green, *The Commonwealth of Lincoln College* (Oxford, 1979), pp. 275-80, 680-1.

²⁴ Smith Ms 45, fol. 109a, Bodleian Library, Oxford. I am grateful to Dr Jane Garnett for her advice about Marshall's papers.

²⁵ E. Gibbon, *The Decline and Fall of the Roman Empire*, II, p. 861.

²⁶ *The True History of the Jacobites Of Ægypt, Lybia, Nubia, etc. and their Origine, Religion, Ceremonies, Lawes, and Customes whereby yau may see how they differ from the Jacobites of Great Britain* (London, 1692) was 'translated by a person of quality', Sir Edwin Sadleir, Bart., of Temple Dinsley in Hertfordshire who was candid about his ignorance of the subject and the purely casual manner in which he decided to study Abudacnus' book. He was surprised, he said, 'by finding the Name Jacobite upon it, an Appellation we now give to the followers of an unhappy Prince fled to the French King for succour' (sig. A2v.). Although Sadleir was aware of the defects of 'the Ancientest, though unhappy erroneous Church in the whole East' he also commended the virtues of the Copts, 'their Piety, Simplicity, entire Obedience to a Patriarch, most unspeakable Zeal for the sacred Writing' (sigs. A3v.-4r.). Above all, however, Sir Edwin Sadleir of Temple Dinsley, known otherwise solely on account of the magnitude of his debts which obliged him to sell the manor of Temple Dinsley, used Abudacnus' history as a document of anti-Jacobite propaganda. It served to make a comparison between the 'Old Jacobites' (or the Copts) and 'the New Jacobites' of the translator's own country, most unfavourable to the latter who, 'instead of fearing their God, and honouring their King.... fear their King, and dishonour their God' and are all 'for extirpating the Protestant Religion, abolishing old English Liberty, and introducing Popery and Slavery' (p. 32). In 1693 Sadleir had a second edition printed in order to correct the numerous printing errors in the first: *The History of the Cophts, Commonly called Jacobites, Under the Dominion of the Turk and Abyssin Emperor* (London, 1693). On Sadleir, see Robert Clutterbuck, *The History and Antiquities of the County of Hertford*, 3 vols. (London, 1827), III, p. 28.

²⁷ By Johann Heinrich von Seelen in Lübeck in 1733, and in an edition by Siegebert Haverkamp, annotated by Johann Nicolai, in Leiden in 1740.

²⁸ Stimulated to study the Copts by the great student of Ethiopic Hiob Ludolf, Wansleben had come from Germany to London in 1661 in order to see to the publication of Ludolf's Ethiopic dictionary. There he met Castell. On his return to Germany he was dispatched to Egypt and Ethiopia by Duke Ernst of Saxe-Gotha who wanted Wansleben to enquire about the points of community between the Copts and the

Lutherans. Wansleben went no further south than Egypt, and then made his way to Rome, where he converted to Catholicism and became a Dominican. He subsequently travelled to Paris where he met Colbert. The sources for his *Histoire de l'église d'Alexandrie* (Paris, 1677) include Abi al-Barakat ibn Kabar, Gabriel ben Tarik and others. For Wansleben's life see A. Pougeois, *Vansleb, savant orientaliste et voyageur. Sa vie, sa disgrâce, ses œuvres* (Paris, 1869).

²⁹ Isaac Basire, *The Ancient Liberty of the Britannick Church, and the Legitimate Exemption thereof from the Roman Patriarchate* (London, 1661), sig.*7r.; *The Correspondence of Isaac Basire, D.D.* (London, 1831), pp. 115-20.

³⁰ See Jean Sauvaget, *Alep: Essai sur le développement d'une grande ville syrienne des origines au milieu du XIXe siècle* (Paris, 1941), pp. 216-19.

³¹ John B. Pearson, A Biographical Sketch of the Chaplains to the Levant Company, maintained at Constantinople, Aleppo and Smyrna, 1611-1706 (Cambridge, 1883), pp. 18-27; 54-9; Alfred G. Wood, A History of the Levant Company (Oxford, 1935), pp. 75-7, 126-7, 162, 217-28; Sonia Anderson, An English Consul in Turkey: Paul Rycart at Smyrna, 1667-1678 (Oxford, 1989), pp. 8-9, 66-116. For Pococke see P. M. Holt, *Studies in the History of the Near East* (London, 1973), pp. 4-5.

³² Henry Maundrell, *A Journey from Aleppo to Jerusalem At Easter AD 1697*, 6th edn. (Oxford, 1740), sig*.blv.

³³ *The Diary of Henry Teonge* (London, 1825), p. 159.

³⁴ L. Twells, *The Life of Dr Edward Pocock* (London, 1816), p. 12; C. Robson, *Newes from Aleppo*, pp. 11-12; *Diary of Henry Teonge*, p. 175.

³⁵ Twells, *Life of Dr Edward Pocock*, pp. 25-6; Holt, *Studies*, p. 5.

³⁶ *The Life of Robert Frampton*, ed. T. Simpson Evans (London, 1876), p. 113.

³⁷ Wood, *A History of the Levant Company*, pp. 242-3. For the chaplains as collectors of manuscripts see C. Wakefield, 'Arabic Manuscripts in the Bodleian Library: the Seventeenth-Century Collections', chap. vii below.

³⁸ *The Life of Robert Frampton*, p. 39.

³⁹ Twells, *Life of Dr Edward Pocock*, pp. 18-28.

⁴⁰ Robson, *Newes from Aleppo*, p. 14.

⁴¹ *The Life of Robert Frampton*, pp. 39-40.

⁴² Robert Huntington, *Epistolæ* (London, 1704), pp. 1-22, 99-104.

⁴³ Holt, *Studies*, pp. 43, 49; Wakefield, 'Arabic Manuscripts in the Bodleian Library', p. 133; Twells, *Life of Dr Edward Pocock*, p. 76.

⁴⁴ R. E. W. Maddison, *The Life of the Honourable Robert Boyle F.R.S.* (London, 1969), pp. 96, 111, 166-9.

⁴⁵ Twells, *Life of Dr Edward Pocock*, pp. 288, 293-300.

⁴⁶ Huntington, *Epistolæ*, pp. 14-15, 21-2.

⁴⁷ On Angelos see Colin Davey, *Pioneer for Unity: Metrophanes Kritopoulos (1589-1639) and Relations between the Orthodox, Roman Catholic and Reformed Churches* (London, 1987), pp. 77-82.

⁴⁸ Pietro Strozzi, *De Dogmatibus Chaldaeorum Disputatio* (Roma, 1617), sig.A3r.

⁴⁹ R. Huntington, *Epistolæ*, p. 99.

⁵⁰ See Runciman, *The Great Church in Captivity*, pp. 165-207; Timothy Ware, *Eustratios Argenti. A Study of the Greek Church under Turkish Rule* (Oxford, 1964), pp. 1-42.

⁵¹ Estefan al-Duwayhi, *Tārīkh al-tā'ifa al-mārūniyya* (Beirut, 1890), p. 453; *idem.*, *Tārīkh al-azmina* (Beirut, 1976), pp. 365-69, 380f., 427f. See Pierre Dīb, *Histoire de l'église Maronite*, (Beirut, 1962), pp. 143, 160-1. For the Rome-educated Maronite historians and their determination to prove the enduring loyalty of their Church to Rome see Kamal S. Salibi, *Maronite Historians of Medieval Lebanon* (Beirut, 1959).

⁵² Sir Henry Blount, *Voyage into the Levant* (London, 1636), p. 109; Alexander Russell, *The Natural History of Aleppo*, 2 vols., 2nd edn. (London, 1794), II, p. 29. Later still, in 1810, John Lewis Burckhardt could write about the Christians in Syria:

'Unable to effect anything against the religion of their haughty rulers, the Turks, they turn to the only weapons they possess, scandal and intrigue, with fury against each other, and each sect is mad enough to believe that its church would flourish on the ruins of those of their heretic brethren.' (*Travels in Syria and the Holy Land* (repr. London, 1992), p. 29. Cf. also pp. 164; 182; 292.)

⁵³ See A. H. de Groot, *The Ottoman Empire and the Dutch Republic. A History of the Earliest Diplomatic Relations 1610-1630* (Leiden, 1978), p. 182.

⁵⁴ See Gunnar Hering, *Ökumenisches Patriarchat und europäische Politik 1620-1638* (Wiesbaden, 1968); K. Rozemond, 'Patriarch Kyrill Lukaris und seine Begegnung mit dem Protestantismus des 17. Jahrhunderts', *Kirche im Osten*, 13, 1970, pp. 9-17.

⁵⁵ *Lettres édifiantes et curieuses, écrites des missions étrangères. Mémoires du Levant*. Tome II (Paris, 1780), ii, pp. 170-1. I owe this reference to Dr G. R. Roper.

⁵⁶ Thomas Smith, *An Account of the Greek Church, as to Its Doctrine and Rites of Worship* (London, 1680), sigs. A3v.-4r., p. 13. Many years earlier Sir Anthony Sherley had expressed a similar idea, describing the 'glorious deed' it would be to free the Christians of the east in *His Relation of his Travels into Persia* (London, 1613), p. 7. For the sad and brief life of the Greek church in London, built in 1680 but leased to the French Huguenots after the ejection of the Greeks two years later, see Runciman, *The Great Church in Captivity*, pp. 296-9.

⁵⁷ The documents of the episode are published in George Williams, *The Orthodox Church of the East in the Eighteenth Century, being the correspondence between the Eastern Patriarchs and the Nonjuring Bishops* (London, 1868). For a survey of Anglican attitudes towards the Greek Orthodox Church, see Runciman, *The Great Church in Captivity*, pp. 289-319.

⁵⁸ Aziz S. Atiya, *A History of Eastern Christianity* (London, 1968), pp. 216-18, describes the dealings of the Syrian Jacobites with the Church of England in the nineteenth century and commends the 'goodwill' and 'the disinterested tone of the English Missionary'. He also discusses the equally sympathetic Anglican approach to the Armenian Church.

⁵⁹ George Williams, *The Orthodox Church of the East*, p. vii.

⁶⁰ *Eutychiei. . . Ecclesiae suae Origines* (London, 1642). It was because of Selden that Edward Pococke published the entire *Contextio Gemmarum, sive Eutychiei Patriarchae Alexandrini Annales* in 1659.

VIVIAN SALMON

ARABISTS AND LINGUISTS
IN SEVENTEENTH-CENTURY ENGLAND

While religious and economic motives encouraged the development of interest in Arabic in sixteenth and seventeenth-century England, it was also actively propagated by a number of enthusiasts. The first of these was Robert Wakefield (d. 1537), a scholar who at various times taught Hebrew at Oxford, Cambridge and Louvain as well as publishing, in 1524, a eulogy on the virtues and usefulness of the three Semitic languages, Arabic, Aramaic and Hebrew, entitled *Oratio de laudibus et utilitate triū linguarum*. In this work, he referred with admiration to the linguistic achievements of his friend Richard Pace (?1482-1536) a member of Henry VIII's diplomatic corps and, at one time, Dean of St. Paul's, although Pace did not display his Arabic learning in print. A less scholarly account of Arabic was given by John Eliot at the end of the sixteenth century. In 1593 he describes Arabic as 'a goodly speech, rich, fluent, and which hath more scope then any other that is spoken in the world'.¹ There are many manuscripts, he remarks, but few printed texts available, in spite of attempts made (when Eliot himself was in Rome) to set up a press. Pope Gregory XIII 'caused very faire Characters to be cut at his charges, and sent all abroad to get workemen in that mysterie';² but Eliot doubts his success, because no printed texts had come to hand yet in England. Eliot was particularly concerned with the value of Arabic for commercial purposes; not only was it valuable in the Levant, it was 'the best tongue in the world to trauaile ouer all the great Turks kingdoms, ouer greatest part of Asia, through all the countries of the Iapanians, through China, through the Empire of *Presbiter Iohn*, and through all Affrike ... by it', he says, 'a man passeth well ouer the third part of the world. It is a singular fine tongue'.³

Eliot's interest was that of a teacher of modern languages who used this information in a dialogue 'Of the dignitie of Orators, and excellencie of tongues'. A more scholarly account of Arabic was provided by a French writer, Claude Duret, in his *Thresor de l'histoire des langves de cest univers*, published at Cologne in 1613. One chapter is devoted to an account *Des Arabes & de la langue Arabesque*, though with comparatively little on the language apart from the Lord's Prayer in italic type. This work must have

been a useful source, however, for contemporary authors in England like Edward Brerewood. A year later, in 1614, Brerewood provides an account of the 'seuerall Languages wherein the Liturgies of Christians in *seuerall parts of the World are celebrated*'⁴ and includes among them Arabic. He describes it as the 'vulgar language' throughout North Africa, Syria, Mesopotamia, Palestine and Egypt even though 'somewhat corrupted and varied in dialect, as among so many seuerall nations it is vnpossibl: but it should bee'.⁵ He disagrees with those who, like Eliot, claim that it is spoken in two-thirds of the inhabited world, but agrees that it is known wherever the religion of Mahomet is adopted because 'all their religion is written in that language, and for that euery boy that goeth to schoole, is taught it, as in our schooles they are taught *Latin and Greeke*: Insomuch, that all the *Turkes* write their owne language in *Arabique* characters.'⁶

Brerewood had no specialised interest in Arabic, but one of his contemporaries did, and he published two texts of relevance to linguistic studies. William Bedwell translated St John's Epistles from an Arabic version into Latin, and published both at Leiden (where Arabic type was available) in 1612 under the title *Epistolæ Catholicæ omnes Arabicæ*. In his introduction Bedwell points out the usefulness of learning Arabic. It is, he says, the only language of religion in extensive areas of the world; it is the chief language of diplomacy there; it is of immense value for reading medical and other scientific works; and it is invaluable as an aid to the elucidation of obscure Hebrew texts. A German scholar arriving in Oxford in the 1620s, Matthias Pasor, supplements this list of virtues in a lecture to the University printed in 1627. He points to the 'copie' or copiousness of Arabic vocabulary, the elegance of the script, and the assistance it offers to the understanding of unusual words of Arabic etymology, such as *Zenith*, *Nadir*, *Azimuth* and *Algol*.⁷

Thomas Greaves, giving another lecture at Oxford (in 1637) as deputy for Pococke, who had been appointed to the Chair of Arabic (1636), introduces a new theme. Arabic contains a large number of 'primitive' or 'root' words, which are capable of almost infinite variation to provide an immense vocabulary. It is also an admirable language because it is free from the innumerable inflections of Latin and Greek.⁸

Bedwell, Pasor and Greaves wrote in Latin for learned colleagues. The next Oxford scholar to specialise in Arabic, Christian Ravis [Ravius] was unusual in writing in English, although he was himself German by birth. His encomium of Arabic was contained in *A Discourse concerning the Easterne Tongues*, published in London in 1648, 1649 and 1650, with different title-pages, and bound in a single volume together with *A Generall Grammer for*

the Ready Attaining of the Ebrew, Samaritan, Calde, Syriac, Arabic, and the Ethiopic Languages. He distinguishes clearly between occidental and Oriental languages, most of the former demanding 'far greater toyle in composition, [with] many terminations without any neede'.⁹ He claims also that Arabic avoids ambiguity and offers a systematic method of word-formation. He argues forcibly for the study of Arabic, pointing out that it is still a living language in Spain, and that as Minsheu's dictionary, *Vocabularium Hispanicolatinum* (1617), had revealed, many thousands of Arabic words had been incorporated into Spanish. He further emphasized that merchants, Biblical scholars and young travellers would particularly benefit. The first group could 'buy any ware cheaper, and at a better rate, than he that can speake nothing' even if they could only 'prattle'.¹⁰ For Biblical scholars, he points out, 'Ebrew is Arabic, which being yet living and in use, is easie to be learnt, and being obtained, will give a more cleare and true interpretation of the Ebrew Bible';¹¹ and he sums up, 'the Arabic tongue will do as much (nay more) good to the understanding of the Ebrue Bibel, then all the *Rabbines* or the *Talmud*'.¹² Finally, he argues, young gentlemen should not travel to France, Italy, Spain or Germany 'to quench their humerous fancies with some *Roman* antiquities, having no life or salvation in them',¹³ but should visit Arabic-speaking countries and learn a living language as well as gain a first-hand knowledge of the geography of the Bible.

One more general encomium of Arabic is worth noting here since, unlike that of Ravis which was offered when he was hoping to replace Pococke in his Chair, it was apparently without self-interest on the author's part. Published in 1663, it indicates just how firmly Arabic had become established as an appropriate subject for scholarly study. The Greek and Hebrew scholar Edward Leigh (1602-71) claims that Arabic is elegant, both for the 'plentie' of words and the 'sweetnesse' of its phraseology. It is profitable both for travellers and for students of mathematics, algebra and medicine, and it is an easy language to learn, without distinctive dialects or inflections and anomalies in grammatical forms.¹⁴ Oddly enough, the book is dedicated to a scholar, James Ussher, who told John Evelyn in 1655 'how greate the losse of time was to study much the Eastern languages, that excepting *Hebrew*, there was little fruite to be gatherd of exceeding labour'. Even 'the *Arabic* itselfe' had 'little considerable'.¹⁵ This is a fairly uncommon view of Arabic; otherwise it was regarded both as admirable as a language in itself, and a vital instrument in acquiring ancient scientific knowledge.

Returning now to the motives which prompted the study of Arabic in seventeenth-century England, we shall find that religious considerations had been influential long before the time of Bedwell.¹⁶ He himself refers to the

Council of Vienne which, in 1312, had enjoined various universities, Oxford included, to maintain teachers of Arabic and to have a care not of medicine and astronomy, but 'of *Diuinitie onely*'.¹⁷ Robert the Englishman's translation of the Qur'an had not only been printed in the sixteenth century, it had been translated into Italian by one Andreas Arrivabene, claiming to have taken his version from the original text. Bedwell comments that it is nothing but 'Retinensis Italianated'; '*neither do I thinke*', he says, '*that he vnderstood much Arabicke*'.¹⁸ Robert had many successors in sixteenth and seventeenth-century England who were interested in Arabic for religious reasons, though not all of them, unlike Robert Wakefield, expressed their interest in print. Among them were Hugh Broughton, who put forward the view, in a discussion of Biblical translation, that 'Arabique . . . is almost Ebrew'¹⁹ and Walter Travers, second Provost of Trinity College, Dublin, and teacher of James Ussher, patron of scholars interested in oriental languages. Robert's Scottish successor, James Hepburn, stands somewhat outside this tradition because, as a Catholic convert, he moved to Rome and became keeper of the oriental manuscripts in the Vatican. He was one of the first scholars born in Britain to produce an Arabic-Latin grammar, but it was never printed and the manuscript has not come to light.²⁰

When Bedwell published in 1615 his translation of a dialogue between two Arabs on religious topics, entitled *Mohammedis Imposturæ*,²¹ he was by no means the earliest English scholar to be concerned with translating Arabic texts as an aid to missionary endeavour. Not only does the dialogue give some account of Muslim beliefs, but an addition, entitled *The Arabian Trudgman*, provides translations of Arabic 'names of honour' and other 'technical' terms intended for the assistance of scholars interested in oriental history.²² A third text, entitled the *Index Assuratarum*, lists the names of the 114 chapters, or 'Assurats' of the Qur'an. The whole Qur'an was translated into English again in 1649, although on this occasion it was a translation of the French version, published in the same year, by Alexander Ross (1591-1654) the theologian, schoolmaster and royal chaplain. Dutch and German translations followed in 1658 and 1697 respectively.²³

Important as it was for English theologians to have access to Arabic texts in order to refute their religious arguments, it was equally important for potential English missionaries to provide Christian texts for Arabic converts. One such text, which was translated into many vernaculars, was the *Veritate Religionis Christianæ* of Hugo Grotius (1583-1645), which was printed in 1660 at the charge of the wealthy and benevolent natural philosopher, Robert Boyle (1627-91).²⁴ While this set out the arguments for Christianity, Arab converts needed, in addition, access to the liturgy of the Church of England.

In 1671 Pococke sent out to the Levant three dozen copies of the Church catechism translated into Arabic²⁵, and in 1675 part of the Book of Common Prayer was translated by Pococke himself under the title of *Partes Præcipuæ Liturgiæ Ecclesiæ Anglicanæ*. The translation may also have owed something to another scholar, Isaac Basire (1607-1676), a self-appointed missionary for the Church of England in the Near East, where he had learnt a modicum of Arabic.²⁶

Translation to and from Arabic was important for missionary activity; but a second religious motivation which led to the study of Arabic was the desire to provide a more accurate English text of the Bible than those which had been available in the sixteenth century. Under James I, a company of theologian-linguists was established to translate 'out of the Original Sacred Tongues, together with comparing of the labours, both in our own, and other foreign Languages, of many worthy men who went before us' (Epistle Dedicatory to the Authorised Version, 1611). They set to work in 1604, examining and comparing a large number of early sources. One of the versions they needed to compare was an early Arabic text—a harmony of the four Gospels by Tatian (fl. 160), the *Diatessaron*, first composed in Syriac; and there were other versions in early Semitic languages which required the services of oriental specialists. The importance of comparing the 'Arabicke Translation of the Scripture' was pointed out by a teacher of oriental languages in early seventeenth-century London, one Edmund Rive. He argues that the Arabic translation was 'set forth neere vnto the dayes of the first Disciples of our Lord... and whereas the Greek copies through Writers negligence in former times afore Printing was vsed, haue diuers readings, by the Arabike Translation it may appeare, which is the auncienter. And in Reuel. 1. 10. the Arabicke readeth: *I was in the Spirit on the first day of the weeke*.'²⁷ This is used by Rive to prove that the Sabbath was not simply a human tradition, but of Divine origin. Among the fifty-four translators of the Authorized Version were at least twenty-five who were acquainted with Old Testament Hebrew, while Bedwell was preeminent in Arabic in the group which met at Westminster. As Thomas Hayne remarked in 1639, Bedwell 'judged that many Hebrew sounds occurring only rarely in the Old Testament, could derive some light from a knowledge of the Arabic language'²⁸—a value for which Bedwell himself recommended the study of Arabic in the preface to his translation of St John's epistles.

There is little doubt that the intensive study of oriental texts for the purposes of the Authorized Version proved a lively stimulus to Arabic linguistic scholarship later in the seventeenth century; so that when the need was felt for an even more massive contribution to Biblical studies in the shape

of a Polyglot Bible, scholars were at hand for the enterprise. The Cambridge scholar Brian Walton (1600-1661) moved to Oxford in 1645, and in 1652 published a circular advertising a proposal to print versions of the Bible in nine languages. Walton explains his intention of comparing 'ancient Translations ... especially those of the *Eastern Languages*; which in regard of their affinity and neernesse to the Original are fittest to expresse ... that sence and reading which was then generally received in the Church of Christ'.²⁹ Among the languages to be printed was Arabic, and several noted Arabists like Pococke, Thomas Greaves and John Vicars were among those who lent their support to his proposal. As Burnet remarked, 'Learning was then high at Oxford; chiefly the study of the oriental tongues, which was much raised by the Polyglot Bible.'³⁰ Bedwell, however, received only a brief mention as translator of the Johannine Epistles in the *Prolegomena* to the Polyglot Bible, published in 1657.³¹

While written Arabic was of prime importance to theologians and Bible translators, it was the spoken language which was essential for merchants and diplomats, as Bedwell himself noted, in expressing his gratitude to one 'M. W.G.'³² who had spent most of his youth in Arab-speaking parts and had assisted Bedwell, together with many other merchants, in understanding many Muslim 'morall sayings'. The identity of M.W.G. is not known, but Hamilton suggests that it was an English merchant then trading to Turkey and Venice, [Mr.] William Garraway,³³ who may have learned Arabic, as Pococke did,³⁴ by employing Arabic servants in their private houses. To some extent the 'secrets of Merchandise' in Africa and Asia had been revealed in English writings,³⁵ but Ravis poured scorn on those who did not think it worth their while to acquaint themselves with the vernacular. 'What', he exclaims, 'a tongue to be the only Country tongue in whole *Africa*, and the third part of *Asia*... and all this tongue without use?'³⁶ He points out that a merchant who can speak the language will be much more successful in his transactions than one who has to rely on an interpreter; such advice would have been useful outside the major Arabic-speaking countries too. Arabic was often an important component of the Creole languages which developed along the great trade routes. In Madagascar, for example, the local dialect was 'a mixture of Arabique'³⁷; in Mohelia, an island to the south-east, the language was 'a mish-mash of *Arabick* and *Portuguise*'³⁸; in Persia, it was reported, there were many loan words from Arabic.³⁹ The language of Arabia itself had, of course, 'no original, but [was] a derivative from the Hebrew.'⁴⁰

The third reason for studying Arabic was neither religious nor commercial, but scientific, and it need only be noted here, since the fact that scholars were drawn to the study of the language because of their interest in mathematical,

geometrical, geographical and medical writings has been clearly demonstrated elsewhere.

With so much interest being evinced in Arabic studies, the question of where the language was taught is a matter of some importance. Teachers were to be found associated with the universities of Oxford and Cambridge, and independently in London. Some of these teachers left few records of their expertise in print, and their achievements are known mainly through the writings of seventeenth-century biographers like Anthony à Wood. Richard Brett (1560-1637), Fellow of Lincoln College, Oxford, is described by Wood as 'skill'd and versed . . . in Chaldaic Arabic and Ethiopic tongues' among others, all of which were, of course, useful to him as one of the translators of the Authorized Version. Another little-known Oxford teacher to whom Wood refers was the Egyptian scholar Joseph Barbatus, associated briefly with the University in the early years of the century.⁴¹ Better known, because of his publications, was Matthias Pasor, Professor of mathematics in Heidelberg, who came to Oxford in 1624, and taught first mathematics and then Arabic. One of his pupils was Edward Pococke. Thomas Greaves (1612-70) became Pococke's deputy when he returned to the Levant with Thomas's brother John in 1637. Most important of these early teachers of Arabic was Christian Ravis, born in Berlin in 1613. After studying oriental languages at Wittenberg and Leiden, he came to England in 1638 and was commissioned by Archbishop Ussher to collect manuscripts in the Levant. On his return to Oxford, he became a Fellow of Magdalen, but failing to obtain the reversion of Pococke's Chair during the Interregnum, he left England.⁴²

In spite of political problems caused by his Royalist sympathies, Pococke was able to assist Brian Walton by collating the Arabic version of the Pentateuch, and to return to Oxford at the Restoration in 1660. By now, several young Oxford scholars were proficient in Arabic; they included Edward Bernard (1638-1696), Fellow of St John's (and also a mathematician); Narcissus Marsh (1638-1713), later Provost of Trinity College, Dublin; and Thomas Hyde (1636-1703) an orientalist with a primary interest in Persian, who left Cambridge to succeed Pococke in 1691. Having proved useful to the government in translating diplomatic correspondence, Hyde was asked to train young scholars for the newly-established Lord Almoner's professorship of Arabic.⁴³

At Cambridge there was hardly less activity in the study of Arabic. William Bedwell was one of the earliest Arabic scholars at Trinity College, although he left the university and in 1607 became vicar of Tottenham. Pococke's biographer Twells remarks of Bedwell that 'the Praise of being the first who considerably promoted the Study of the *Arabick Language* in Europe

may perhaps more justly belong to him, than to *Thomas Erpenius*, who commonly has it'.⁴⁴ Among the Cambridge alumni who encouraged Arabic was Sir Thomas Adams (1586-1608), a graduate of Trinity College and Clare Hall. He founded an Arabic lecture at the instigation of another Trinity and Clare graduate, Abraham Wheelocke (1593-1653), student of Arabic, Persian, and Anglo-Saxon. Adams's interest in the language sprang from religious motives, and in particular from his desire of helping to convert Muslims to Christianity. Other Cambridge scholars, like Thomas Comber, are known to have been proficient in the language, but the most important figures in the university were Abraham Wheelocke, who occupied the lectureship (later Chair) founded by Adams in c.1630, and Edmund Castell (1606-1685), his successor. Wheelocke himself declared that he could publish little because of the lack of Arabic type in Cambridge, even though William Bedwell had bequeathed to the university, together with his manuscripts, a font of Arabic type which he had obtained from the Leiden heirs of the printer Raphelengius, but this was never used.⁴⁵ Nevertheless, Edmund Castell, appointed to the Cambridge Chair of Arabic in 1664, was able to produce, using types cut by the university, a splendid dictionary, the *Lexicon Heptaglotton* (1669), in which he acknowledges, by means of the abbreviation Bd., his frequent borrowings from Bedwell's manuscripts. Distinguished in research, he appears to have been no teacher. Finding himself abandoned by his pupils, he posted up a notice at the entrance to the lecture room, saying 'Tomorrow the professor of the Arabic language will go into the wilderness'.⁴⁶

London, sometimes described as 'the Third University of England',⁴⁷ was the remaining English centre for the study of Arabic. It is somewhat surprising to find that one of John Eliot's dialogues, set in a bookseller's shop, shows buyers asking for copies of the Qur'ān in Arabic:⁴⁸ but early in the century it was certainly the case that 'there be also in the Cittie [London] Teachers and Professors . . . of . . . Arabike, or Larbey [l'arabie?] Languages',⁴⁹ which like others listed, are 'fit for Embassadors and Orators, and Agents for Marchants, and for Trauaylors, and necessarie for all Commerce or Negotiation whatsoever'. We know practically nothing of these independent teachers, though perhaps Bedwell, in his vicarage at Tottenham, might be included among them. Certainly there were private academies by mid-century which offered foreign language teaching. One of the best known was that of Sir Balthazar Gerbier.⁵⁰ Christian Ravis gave a public lecture on Arabic⁵¹ at 'London House' in which he advocated the establishment of separate colleges for teaching Arabic, Persian, Turkish, Malayan and Chinese 'with a whole Colledge for every Nation apart'.⁵² So popular did the study of Arabic become that it was even taught in the upper forms of one London

schools—Westminster—where the Headmaster, Richard Busby, had written an Arabic grammar for the use of his pupils⁵³; and so successful was his teaching that the schoolboys were able to ‘make orations’ in Arabic and other oriental languages, as John Evelyn reported witnessing in 1661.⁵⁴

One of the great difficulties for English scholars in publishing the results of their research in Arabic was the lack of Arabic type. Early works quoting Arabic words presumably used engraved wood blocks; the earliest type was cast for the Medici Press in 1585, but seems not to have been known in England for some time.⁵⁵ The scholarly printer Francis Raphelengius (1539–1597), who taught Arabic at Leiden, had Arabic type cut there, probably in 1594, and it was introduced into Breslau by Peter Kirsten in about 1608. In 1649, however, Ravis felt impelled to claim that ‘there are some copy bookes published in sundry countries, wherein (that they might bee thought to bee skillfull in strange tongues) they have made such foul worke about the *Syriac*, *Arabic*... Letters that I am ashamed of them. Nay among printed bookes onely *France* and *Italy* have good *Arabic* characters’.⁵⁶ By now matrices of Arabic had been acquired from Leiden by Archbishop Laud; these were sufficient to print a text by Pococke and some passages of Arabic in other works. But it was not until 1654–5 that a large supply was cast by the University’s foundry, and printing Arabic texts became entirely feasible. Before Arabic writings could be appreciated by English scholars, appropriate textbooks had to be provided, and these in time became available in the form of dictionaries, grammars and readers. The earliest form of Arabic lexicon printed in Britain was that to be found in Bedwell’s *Arabian Trudgman*, which included translations of ‘certaine Arabicke termes . . . used by Historians’ (title-page) of mainly Arabic titles of honour. His great lexical achievements were not made public until after his death, when in seven folio manuscripts and two quarto volumes, they were incorporated by Edmund Castell in his *Heptaglotton*.

Another work available in England was Minsheu’s *Vocabularium Hispanicolatinum* (1617), which although a dictionary of Spanish, gave some assistance to students of Arabic by marking with an obelisk loan words from Arabic into Spanish; after 1613 they would have had access to the dictionary printed by Raphelengius. Some twenty years later there was available an abridged version of Valentine Schindler’s *Lexicon Pentaglotton*, which was made in 1635 by William Alabaster (1567–1640). Like Bedwell an alumnus of Trinity College Cambridge, he had probably learned his Arabic, not in academic surroundings, but in Spain, which he had visited in the entourage of the Earl of Essex. English scholars had to rely on Continental sources for more comprehensive dictionaries until the publication of Edmund Castell’s *Lexicon Heptaglotton* (1669), intended as more than a simple dictionary of seven

languages 'descended from the Hebrew'. Its purpose was to show 'the cognation and dependance which is betwixt these languages, whereby they will very much illustrate one another'.⁵⁷ He pointed out, however, that this dictionary would not only enable scholars to read the Polyglot Bible, but also to understand the Qur'ān itself. Furthermore, he claimed that the arrangement would enable the 'unskilfull' to find derivatives from the root, or radix, by means of the so-called 'servile' letters. These words come from the prospectus entitled *Lexicon Linguarum Orientalium*, which Castell issued in 1658, inviting subscriptions to the work, and which was signed by a large number of supporters, including Walton and Pococke.

Grammars of Arabic were also, in the early years of the century, the work of Continental rather than English scholars. The Dutch scholar Erpenius, who visited Bedwell in about 1608, produced a *Grammatica Arabica* (1613) in which he referred to Bedwell's expertise in the language, and a revised version, entitled *Rudimenta Linguae Arabicæ*, in 1620. In the same year the important grammar by Francis Martellotus, *Institutiones Linguae Arabicæ*, was published in Rome. It was dedicated to Pope Paul V in acknowledgement of his encouragement of Arabic studies for the conversion of the Muslims. English scholars had little to contribute to the development of Arabic grammar, and it was the German Ravis who produced the first major grammatical study of Arabic and cognate tongues in the English language, as part of a comparative treatise. Ravis was helped by the fact that he was well acquainted with Hebrew grammar, having studied John Udall's English translation of Martinus's grammar, *The Key of the Holy Tongue* (1593), of which he was later to produce an annotated version. In 1649 he published *A Generall Grammer for the Hebrew, Samaritan, Calde, Syriac, Arabic, and Ethiopic Tongue* (a work with a complex bibliographical history and with a slightly different title-page in the 1650 impression). He justified producing a single grammar for all these languages because he said they 'are but one and the same language',⁵⁸ all of which began with the creation of Adam.⁵⁹ He notes in particular that Martinus had, without knowing Arabic, made certain features of his grammar so like those of Arabic 'as if he had the knowledge of that tongue perfectly'.⁶⁰ A second general observation he makes is that Arabic and Hebrew must not be treated as if they were cognate with Greek and Latin; 'it is but in vaine', he says, 'to fashion the ebrue grammar after the greeke & latine grammars'.⁶¹ He constantly attacks the attempt to model oriental on occidental grammar, claiming, for example, that if the grammarians had not 'the anomalies and defects of the pronownes in latine and greeke ... yet in their memorie, and had never yet learned great grammars, but some little compendious ones they would have made more plaine worke about the

pronounes here.⁶² A third observation made by Ravis is that classical Arabic grammarians made the production of new grammars far too difficult because they 'gave us their termes, and titles, which are so strange, that no body knowes what to make of them, some Nouns were *sound*, others *broken*, whereof no sound sense can be made at this very day in all England'.⁶³

It would be inappropriate in a collection not devoted specifically to linguistic studies to discuss in technical detail Ravis's approach to grammatical analysis, but one principle of general interest might be mentioned. At a time when scholars writing grammars of the European vernaculars felt it necessary and desirable to make the categories of the language under description fit the well-understood and traditional categories of Latin, Ravis, following the precedent of some sixteenth-century Hebrew-Latin grammars, treated Hebrew and other Semitic languages as wholly independent. He argues (though incorrectly), for example, that there is no need whatsoever to allow for a category of conjunctive in Arabic because, as he says, there is 'no speciall *termination*' which marks it off from the indicative.⁶⁴

In view of Ravis's inadequate understanding of Arabic, it is not surprising that Walton thought it desirable to produce another and simpler textbook in 1655, *Introductio ad Lectionem Linguarum Orientalium*, which includes a description of the phonology of Arabic including its non-English category of 'gutturals'. As for a reader in Arabic, one was produced by Pococke in 1661. This is the *Lāmiyyat al-Ajam*, generally known as *Carmen Tograi* (from the author's name, 'Alī al-Ṭughrā'i, d. 1120 AD) consisting of an Arabic poem with detailed textual, explanatory and grammatical notes. As his biographer Twells notes, he composed it 'to make the Attainment of the *Arabick* Tongue more easy to those, that study it; for his Notes, containing a Grammatical Explanation of all the Words of this Author, are very serviceable for promoting the Knowledge of that Language'. It also contains 'a succinct, yet as accurate an Account of the *Arabick* Tongue, as is any where extant'.⁶⁵

It is appropriate to give this factual account of Arabic language study in seventeenth-century England, because there has been hitherto so little discussion of its progress and extent. What is more important to the student of linguistics, however, is the insight which the study of Arabic gives into the evolution of comparative philology. It is true, of course, that a Semitic language, Hebrew, was already quite well known in the sixteenth century,⁶⁶ as well as Aramaic and Syriac. In the seventeenth century, Ravis identified Hebrew with Arabic (cf. p. 3 above), and by the late eighteenth century it was clear that there was a language family quite distinct from Indo-European; that its structure, vocabulary and script were totally independent of the European vernaculars, and that they ought to be studied as quite distinct phenomena.

Secondly, the knowledge of Arabic gave an impetus to the search for a new form of language which would be of special value for 'philosophical' (scientific) and international communication. It would provide for a totally unambiguous, one-to-one relationship between word and concept, and include in the form of the word itself the meaning of the object denoted; that is, it would have an iconic vocabulary based on a coherent organisation of concepts. Among those who were involved in the construction of philosophical languages were four scholars conversant with Arabic or Hebrew. Francis Lodwick, author of the earliest printed attempt at a universal language (1652), left a manuscript discussion of 'the sound of some of the hebr. and Arrabik letters'.⁶⁷ John Wallis, Savilian Professor of Geometry at Oxford, while ignorant of the language as a whole, often referred to the sounds of Arabic in his *Tractatus de Loquela*.⁶⁸ It was composed while he was discussing with John Wilkins the construction of his philosophical language, *An Essay Towards a Real Character, and a Philosophical Language* (1668). In this work there are various references to Arabic, as well as the text of the Lord's Prayer in Arabic (both language and script). George Dalgarno cites Hebrew and 'many other of the Eastern languages' as the ultimate inspiration for his philosophical language entitled *Ars Signorum*.⁶⁹ Wallis, Wilkins, and Dalgarno were all resident in Oxford for at least part of the time when Pococke was teaching Arabic, and Wilkins actually headed a petition to the Parliamentary Committee which was enquiring into universities, asking them (successfully) not to implement their proposal (made for purely political reasons) of discontinuing Pococke's Arabic lectures.⁷⁰

Although only Dalgarno refers directly to oriental languages as a source of inspiration, certain characteristics of Arabic correspond closely with desiderata which the language-planners laid down for their projects. They must be based on reason, that is, on principles common to 'all languages . . . laid down by men'. Ravis argues that Arabic is 'most agreeable to the nature of man, requiring to be studied more by reason than an infinity of rules, more trying the use of our reason, than the strength of our memory'.⁷¹ The lexicon of a philosophical language should be contrived in such a manner as 'to suit Words to the Nature of the Things they signify', a characteristic which Pococke claims for Arabic.⁷² The philosophical language should also, like Arabic, be 'perspicuous'. Such clarity resided partly in the coherent ordering of words 'depending upon one another without interruption, it being impossible that any should be entered or taken out without the dissolution of the naturall chaine; so also doe those things hang together which they signifie'.⁷³

If it is suggested here that Arabic is based on conceptual classes, such a belief may have been due to the large number of derivatives which were to be

formed from each 'primitive',⁷⁴ by reason of 'the addition of servile, or detraction of some Radicall Letter, or Letters.'⁷⁵ The semantic ramifications of these derivatives enable Arabic to 'provide just the right word for any concept, abstract or concrete', as a modern critic has remarked, pointing out that the key word is *ishtiqāq*, which may be glossed 'derivation'.⁷⁶ Such a method of word formation was to be found in the projects of Lodwick and Wilkins, as one element in conceptual classification. Another feature of both Arabic and of philosophical languages was the structure of the word, which depended on a regular alternation of consonants and vowels producing combinations without contiguous consonants. The Protestant missionary, John Eliot, longed for an invented language based on the 'trigrammatical foundation' of Hebrew, which, like Arabic, is 'capable of a regular expatiation into millions of words'.⁷⁷ Dalgarno, in 1680, also referred with approval to the fact that in Hebrew and other oriental languages no composition of either vowels or consonants is allowed within a single syllable, but all radical words consist of consonants and vowels succeeding one another in alternation (p. 163). This construction gave rise to an 'iconic' lexicon in Wilkins's project, in which each individual vowel or consonant is endowed with a specific signification, referring to some property of the object denoted. A further characteristic of both Arabic and philosophical language projects was the fairly simple nature of their grammars, both in respect of the number of grammatical categories and the lack of complex inflections. Arabic grammar was based on Noun, Verb and Particle;⁷⁸ and as Thomas Greaves remarked,⁷⁹ it was free from the ambiguity and complication of innumerable inflexions—a feature of the ideal philosophical language much commended by Wilkins.

It cannot be claimed that philosophical language projects were directly inspired by Arabic, but it was certainly the case that the most distinguished scholars among those interested in the topic were acquainted with Pococke; Wilkins and Wallis themselves had some slight knowledge of Arabic. More generally, many of the language projectors were motivated by the desire to recreate, if not the language of Adam itself, at least something comparable in its perfection.⁸⁰ The Adamic language is a topic of discussion in both the Hebrew Genesis and the Arabic Qur'ān.⁸¹ While the Biblical account of the origin of language is limited to showing God parading the animals before Adam so that he can name them, the accretion of detail which inspires so much mystical speculation in seventeenth-century England may ultimately have derived from either Hebrew or Arabic traditions of the Middle Ages.⁸²

NOTES

I should like to thank D. Agius, A. Hamilton and G. A. Russell for being kind enough to read this paper and to save me from some mistakes partly due to my amateur status as an Arabist. I am, of course, solely responsible for any errors that may remain.

¹ J. Eliot, *Ortho-epia Gallica. Eliots Fruits for the French* (London, 1593), p. 21.

² *Ibid.*, p. 22.

³ *Ibid.*, p. 22. A detailed account of instruction in Arabic, mainly in the sixteenth century, is provided by Robert Jones in *Learning Arabic in Renaissance Europe (1505-1624)*. Studies in Intellectual History, 26 (Leiden: E.J. Brill, forthcoming; University of London Ph.D. thesis, 1988).

⁴ E. Brerewood, *Enquiries touching the Diversity of Languages, and Religions* (London, 1614), Chapter 26.

⁵ *Ibid.*, p. 61.

⁶ *Ibid.*, p. 62.

⁷ M. Pasor, *Oratio pro Linguae Arabicæ Professione* (Oxford, 1627), sig. B2r.

⁸ T. Greaves, *De Linguae Arabicæ utilitate et præstantia* (Oxford, 1639), pp. 7, 119-20.

⁹ C. Ravis, *A Discourse concerning the Easterne Tongues* (London, 1649), p. 17.

¹⁰ *Ibid.*, p. 30.

¹¹ *Ibid.*, p. 69.

¹² *Ibid.*, p. 48.

¹³ *Ibid.*, p. 33.

¹⁴ E. Leigh, *Fœlix Consortium* (London, 1663), p. 60.

¹⁵ J. Evelyn, *The Diary of John Evelyn*, ed. E. S. de Beer (Oxford, 1955), III, p. 156.

¹⁶ R. Weiss, 'England and the Decree of the Council of Vienne on the Teaching of Greek, Arabic, Hebrew and Syrian', *Bibliothèque d'Humanisme et Renaissance*, XIV (1952), 1-9.

¹⁷ W. Bedwell, *Mohammedis Imposturæ; The Arabian Trudgman; Index Assuratarum* (London, 1615), sig. A4r.

¹⁸ *Ibid.*, sig. A4v.

¹⁹ H. Broughton, *An Epistle ... Touching Translating the Bible* (Middelburgh, 1597), p. 52.

²⁰ It was seen by a contemporary, Thomas Dempster, and mentioned in his *Historia Ecclesiastica Gentis Scotorum* (Bologna, 1627), p. 363.

²¹ See A. Hamilton, *William Bedwell, the Arabist (1563-1632)* (Leiden, 1985), p. 66.

²² See L. B. Wright, 'Language Helps for the Elizabethan Tradesman', *Journal of English and Germanic Philology*, XXX (1931), 335-47.

²³ Ross's translation is entitled *The Alcoran of Mahomet. . . . A Needfull Caveat or Admonition*. The translation inspired a lively interest in Islam; between 1649 and 1683 'Englishmen felt for the last time that they could not afford to be ignorant or indifferent to Islam.' See N. I. Mattar, 'Islam in Interregnum and Restoration England', *The Seventeenth Century*, 6 (1991), 68. On the other translation, see J. Fück, 'Die Arabischen Studien in Europa vom 12. bis in den Anfang des 19-Jahrhunderts', *Beiträge zur Arabistik, Semitistik und Islam-Wissenschaft*, eds. R. Hartmann & H. Scheel (Leipzig, 1944).

²⁴ L. Twells, *The Theological Works of the Learned Dr. Pocock ... to which is Prefixed an Account of his Life*, 2 vols. (London, 1740), Vol I, 'The Life', pp. 56-7.

²⁵ *Ibid.*, p. 68.

²⁶ W. N. Darnell, *The Correspondence of Isaac Basire, D.D.* (London, 1831), p. 291.

²⁷ E. Rive, *An Heptaglottologie* (London, 1618), p. 30.

²⁸ T. Hayne, *Linguarum Cognatio* (London, 1639), sig. A4v. [*judicavit multas voces Ebræas raro in Veteri Test. occurrentes, ex linguæ Arabicæ cognatione aliquid lucis posse mutuari*].

²⁹ B. Walton, *A Brief Description of an Edition of the Bible* (London, 1652), p. 1.

³⁰ C. Wordsworth, *Scholæ Academicæ* [1877] (London, 1968), p. 167.

- ³¹ Hamilton, *William Bedwell, the Arabist (1563-1632)*, p. 153.
- ³² Bedwell, *Mohammedis Imposturæ*, sig. A2v.
- ³³ Hamilton, *William Bedwell, the Arabist 1563-1632*, p. 144.
- ³⁴ Twells, *Works*, p. 6.
- ³⁵ Ravis, *A Discourse concerning the Easterne Tongues*, p. 29.
- ³⁶ *Ibid.*, pp. 28-9.
- ³⁷ T. Herbert, *Some Years Travels into Divers Parts of Africa, and Asia the Great* (London, 1677), p. 22.
- ³⁸ *Ibid.*, p. 27.
- ³⁹ *Ibid.*, p. 117.
- ⁴⁰ *Ibid.*, p. 103.
- ⁴¹ On Brett cf. A. à Wood, *Athenæ Oxonienses*, ed. P. Bliss (London, 1813-1820) II, pp. 611-2; and on Barbatus cf. Wood *Fasti Oxonienses*, ed. P. Bliss (London, 1815) I, pp. 301-2. Hamilton points out that Barbatus was associated with Oxford for a much shorter time than Wood implies, see *Bedwell*, pp. 34-35.
- ⁴² See 'Ravis', *Dictionary of National Biography*, XVI, p. 762.
- ⁴³ L. Sutherland, 'The Origin and Early History of the Lord Almoner's Professorship in Arabic at Oxford', *Bodleian Library Record*, X (1930), 166-77.
- ⁴⁴ Twells, *Works*, p. 2. On Bedwell and Erpenius, see also A. Hamilton, "'Nam Tirones sumus': Franciscus Raphelengius' *Lexicon Arabico-Latinum* (Leiden, 1613)", *De Gulden Passer*, 66/7 (Antwerp, 1989), pp. 557-89, esp. pp. 576, 681.
- ⁴⁵ On Bedwell's type, see A. Hamilton, 'The Victims of Progress: the Raphelengius Arabic Type and Bedwell's Arabic Lexicon', *De Gulden Passer (Liber Amicorum Leon Voet)* (Antwerp, 1985), pp. 97-108. A more recent account of Wheelocke than that in the *Dictionary of National Biography* is given by M. Murphy & E. Barrett, 'Abraham Wheelocke, Arabist and Saxonist', *Biography*, 8 (1985), 163-185.
- ⁴⁶ Wordsworth, *Scholæ Academicæ*, p. 163. [Arabicae linguæ professor cras ibit in desertum.]
- ⁴⁷ G. Buck, 'The Third Universitie of England' in J. Stow & E. Howes, *The Annales, or Generall Chronicle of England* (London, 1615), pp. 958-88.
- ⁴⁸ Eliot, *Ortho-epia Gallica*, p. 67.
- ⁴⁹ Buck, 'The Third Universitie of England', *The Annales*, p. 983.
- ⁵⁰ B. Gerbier, *The Interpreter of the Academie for Forrain Languages* (London, 1648).
- ⁵¹ C. Ravis, *Sir You are intreated to give notice in publick* (London, 1647).
- ⁵² Ravis, *A Discourse concerning the Easterne Tongues*, p. 67.
- ⁵³ J. Sargeaunt, *Annals of Westminster School* (London, 1898), pp. 115-6.
- ⁵⁴ Evelyn, *The Diary of John Evelyn*, III, p. 287.
- ⁵⁵ Broughton, *An Epistle... Touching Translating the Bible*, p. 10.
- ⁵⁶ Ravis, *A Generall Grammer*, p. 103.
- ⁵⁷ E. Castell, *Lexicon Linguarum Orientalium* (London, 1658), p. 1.
- ⁵⁸ Ravis, *A Discourse concerning the Easterne Tongues*, p. 5.
- ⁵⁹ *Ibid.*, p. 12.
- ⁶⁰ Ravis, *Annotations for the Second Edition of Petrus Martinus, The Key of the Holy Tongue* (Amsterdam, 1650), p. 180.
- ⁶¹ *Ibid.*, p. 166.
- ⁶² *Ibid.*, p. 184.
- ⁶³ Ravis, *A Generall Grammer*, pp. 187-8.
- ⁶⁴ *Ibid.*, p. 173.
- ⁶⁵ Twells, *Works*, pp. 58-9.
- ⁶⁶ See G. Lloyd Jones, *The Discovery of Hebrew in Tudor England* (Manchester, 1983).
- ⁶⁷ V. Salmon, *The Works of Francis Lodwick in the Intellectual Context of the Seventeenth Century* (London, 1972), p. 86.
- ⁶⁸ J. Wallis, 'Tractatus de Loquela', *Grammatica Anglicana* [1653], ed. J. Kemp (London, 1972), *passim*.

- ⁶⁹ G. Dalgarno, *Didascalocophus, or the Deaf and Dumb Mans Tutor* (Oxford, 1680), p. 99.
- ⁷⁰ Twells, *Works*, p. 32.
- ⁷¹ Ravis, *A Discourse concerning the Easterne Tongues*, pp. 3, 18.
- ⁷² Twells, *Works*, p. 59.
- ⁷³ Ravis, *A Discourse concerning the Easterne Tongues*, p. 64.
- ⁷⁴ Greaves, *De Linguae Arabicæ Utilitate Præstantia*, p. 7.
- ⁷⁵ Castell, *Lexicon Linguarum Orientalium*, p. 1.
- ⁷⁶ C. A. Ferguson, 'Myths about Arabic' in *Readings in the Sociology of Language*, ed. J. A. Fishman (The Hague, 1968), p. 377.
- ⁷⁷ C. Emery, 'John Wilkins and Noah's Ark', *Modern Language Quarterly*, IX (1948), 287, ft. 4.
- ⁷⁸ See G. Troupeau, 'Les Arabisants Européens et le Système Grammatical Arabe', *Histoire, Epistémologie, Langage*, II (1980), 3-7.
- ⁷⁹ Greaves, *De Linguae Arabicæ Utilitate et Præstantia*, p. 19.
- ⁸⁰ See D. Katz, 'The Language of Adam in Seventeenth-Century England', in *History and Imagination*, eds. H. Lloyd-Jones and V. Pearl, *Essays for H. Trevor-Roper* (London, 1981), pp. 132-145.
- ⁸¹ M. Brevia Claramonte, 'The Arab Notion of Original Language and Sanctius' Logical Level', *Histoire, Epistémologie, Langage*, IV (1982), 106-115.
- ⁸² H. Loucel, 'L'Origine du Langage d'après les Grammairiens Arabes', *Arabica* X (1963), 188-208, 253-81; XI (1964), 57-72, 151-87; and B. G. Weiss, 'Medieval Muslim Discussions of the Origin of Language', *Zeitschrift der Deutsche Morgenländischen Gesellschaft*, 124 (1974), 31-41.

H.T. NORRIS

EDMUND CASTELL (1606-86) AND HIS
LEXICON HEPTAGLOTTON (1669)

The Reverend Edmund Castell was the second holder of the Sir Thomas Adams Professorship in Arabic at the University of Cambridge. He occupied this status between 1667 and 1685. That he ever attained the office was in part due to his father's inheritance, in part due to his friends and in part due to favour which he received from King Charles II, to whose chaplaincy he was appointed in 1666. It is, however, one work, his one and only masterpiece, that brought him some fame, though hardly success, and gave him a permanent mention within the annals of British Orientalism, namely his *Lexicon Heptaglotton*.

Edmund Castell was baptized in East Hatley church, Cambridgeshire, on 4th January 1606. From his father he inherited a fair estate which was to be the mainstay of his life of academic labours. In 1621 he entered Emmanuel College, Cambridge, and he took the successive degrees of Bachelor (1624-5), Master of Arts (1628), Bachelor (1635) and Doctor (by mandate 1661) of Divinity. He next moved to St John's College, mainly on account of its library. Whenever he came to Cambridge from his incumbencies, he would often stay in lodgings at Catherine Hall at the invitation of his friend the Rev John Lightfoot, its Master, with whom he regularly corresponded. He was esteemed by some for his efforts in assisting Bryan Walton to complete his *Polyglot Bible*. This was matched by the admiration of others for Castell's own labours to complete his *Lexicon Heptaglotton* which was begun in 1651 and finally published in 1669. This labour had already cost him £12,000 by 1667, and the maintenance of seven English and seven foreign assistants who eventually forsook him. He wrote in despair 'I am now, therefore, left alone, without amanuensis or corrector; my bodily and mental strength impaired, my eyesight almost gone'. Initially the *Lexicon* met with a cold reception in England, as the *London Gazette* (no 429, December 23-27, 1669) shows in its sales advertisement. It had detractors as well as admirers. Walton's *Polyglot* (in 6 volumes and published at a cost of £8,400) had been stigmatized as 'affording a foundation for Mohammedanism; as a chief and principal prop

of Popery; as the root of much hidden Atheism in the world'. Castell's *Lexicon* was also criticised. Castell's writing at times was eccentric. His embellishment, in a number of Semitic languages and in Persian, of the customary odes to Charles II, on the latter's succession, called 'The Sun rising on England, under the auspices of Charles the Second, most glorious of Kings', make this abundantly plain.

The *Lexicon* became Castell's obsession, taking precedence over all other tasks and other duties. It remained the sole consolation of his life, whether as the holder of a chair at the University of Cambridge, or else as an incumbent in his parishes in Essex, Cambridgeshire and Bedfordshire. He put up his own monument in Latin and in Arabic, in Higham Gobion church, which stands on the edge of the Chilterns near Hitchin and where he ended his days. It is to be noted that in the Latin inscription, amidst his titles, only the *Lexicon Heptaglotton* receives a mention. In his will, dated 24th October 1685, it is again the *Lexicon* which figures in the bequests left to his near relatives and friends.

What motives lay behind this eccentric single-mindedness? 'It is one of the striking characteristics of Dr Castell', wrote the Bedfordshire historian, Ivan O'Dell, 'this astonishing persistency and determination. His great work, the *Lexicon Heptaglotton*, that should have brought him recognition, cost him untold labour and anxiety.'¹ Near the end of his *Oratio ... in secundum Canonis Avicennae Librum* (1667), Castell remarks sadly to his audience of young scholars:

So that literature flourishes and more every day, which people here have until now held to be very exotic. Through you, let this Arabic of ours, which abounds with such great and rich treasures, not remain a desert. Look at me, the image of a faithful [promicondi?], how readily, willingly and happily I have brought forth those things which I have accumulated through a long career of many years, tireless labours, unremitting vigils and expenditure scarcely to be believed.

ORIENTALISTS OF THE CAMBRIDGE REGION AND THE BACKGROUND TO CASTELL'S STUDIES

In order to assess Castell's labours it is of some relevance to bear the following in mind:

(a) There was a substantial number of Orientalists in the Cambridge region who were personal friends and colleagues, both within the University itself and in parishes outside it. They were in close contact with each other as well as with their Oxford colleagues. An amusing feature of the Arabists was the

way that their writings, including their private correspondence, were sometimes capped or tailed with pious Arabic words or expressions. A letter might open with the *basmala*—in the name of Allah, the Compassionate, the Merciful; or it might be signed by Bedwell with *al-faqih*, the academic master, written in a Maghribi hand. A letter to Abraham Wheelock, for example, is addressed to *al-hudhud*, the hoopoe.

(b) These orientalist scholars shared deeply held and zealous religious aims.

(c) The *London Polyglot Bible*, compiled under the superintendent of Bryan Walton, and printed by Thomas Rycroft in 1657 made a strong impression upon those amongst them who were Hebraists, philologists, and lexicographers.

(A) *Orientalists To The South Of Cambridge*

The rural districts to the south of Cambridge, in the seventeenth century, were the home of a significant number of incumbents and scholars who were prominent figures in Semitic and Oriental studies, more especially in the latter half of the century. The incumbencies included the parish of Great Hallingbury in Essex, to the east of Bishops Stortford, where William *Bedwell*, the Arabist (1563-1632) was baptized. After 1692 it was the parish of Robert Huntington, a friend of Pococke and who, prior to that date, was an inveterate hunter of Oriental manuscripts, especially those of the Eastern Churches. Fortunate enough to have the opportunity to visit the East, he undertook this whilst he was chaplain to the Levant Company in Aleppo after 1670. Huntington, who corresponded with al-Duwayhī, the Maronite patriarch of Antioch, amongst other Eastern Primates, was struck by what seemed to him to be similarities between the Eastern Churches and the Anglican Church, and he shared his impressions with his colleagues.

Edmund Castell may have benefitted from the help of Robert Huntington both before, and certainly after, the publication of his *Lexicon Heptaglotton*. It was so in the case of the John Lightfoot, the vicar of Wadesmill and Great Munden in Hertfordshire to the south of Royston, an incumbency close to an old route between London and Cambridge. Lightfoot regularly corresponded with Edward Bernard of St. John's College, Oxford, who, in turn, offered to contact Huntington on Lightfoot's behalf. Bernard wrote to Lightfoot in 1674:

Reverend and right learned, I cannot but acquaint you, that the learned and pious Mr Robert Huntington, present minister of the church of the English factory at Aleppo, hath lately sent over hither a good Samaritan Pentateuch, together with an account of the religion of the Samaritans of Sychem, written by themselves there upon his request, and sent as it were to their brethren here



1. The Arabic inscription included on Edmund Castell's own monument, which was put up by him, in Higham Gobion Church, near Hitchin.

in England (as they mistook Mr Huntington, who told then that there were Hebrews here, he meaning Jews, and they their own sect). The translation whereof into Latin out of the Samaritan (which is nothing but the Biblical Hebrew, save some Arabisms here and there: for that is the language commonly made use of by them at Seychem), I have here sent; and, if you think it worthy the while, I will also transmit a copy of the Samaritan unto you. Mr Huntington acquaints me, that there are about thirty families of these Samaritans at Sychem, and not more, and that they desire correspondence here. But care is to be taken that we do not dissemble with them, but beg their history of Joshua, and their liturgy; and also examine them upon points that may be material. If you please to send what questions you would desire resolution from them in, I will send them to Mr Huntington, to whom I shall write about three weeks hence.²

Lightfoot was in regular correspondence with Johannes Buxtorf, noted Hebrew scholar in Basel, with Pococke, in Oxford, with Samuel Clarke and with John Worthington, sometime master of Jesus College, Cambridge. Lightfoot's personal relationship with Castell was close. This is reflected in their correspondence. According to an entry in the *Appendix* to the life of Lightfoot,³ containing extracts from twenty-three letters between Castell and Lightfoot during 1664 to 1670, the following remarks and comments are made:

One conference . . . between Dr Castell, who was 'The Propounder,'—and our Doctor [Lightfoot], 'The Resolver,'—was upon this subject proposed by the former, 'Whether when the ordinary interpretation of any Hebrew words renders the sense hard and rough, recourse may not be had to the interpretation of those words according as they signify in Syriac, Chaldee, or Arabic.'

Another Cambridge Orientalist who took a personal interest in Castell's endeavors was John Worthington. In December 1660 he wrote the following in a letter to Samuel Hartlib:⁴

If the Christian religion were but once freed from all those unworthy dogmata which have clogged and encumber'd it, then would the beauty, healthfulness, and vigor of it be discover'd; and it would be fitted for better entertainment in the world, and a quicker passage through the nations of the earth. . . . I know no two designs so considerable for such like advantages to Christianity, as the publishing this ancient body of the Jewish religion, the Mishneh, and also the Alcoran, in a language generally known, as the Latin is. . . . Dr Castel writes to me, that he thinks Petraeus is yet in Holland, and that he hath seen Petraeus his new Ethiopick piece, viz Ruth, an homily of S Chrysostom, and the four first chapters of Genesis in Ethiopick, which was lent him by an ambassador to peruse. I am heartily sorry for Dr Castel's difficulties.

Among other Orientalists, both predecessors and contemporaries of Castell, there was, for instance, Francis Burley, the vicar of St Michael's parish church in Bishops Stortford and of neighbouring St James's, Thorley, who was

formerly at St Catherine's, at Queen's and at Pembroke Hall, Cambridge. He collaborated with William Bedwell, under the supervision of Bishop Lancelot Andrewes, on the translation of the Bible. Lancelot Andrewes fostered Oriental studies in Cambridge in the late sixteenth century, and it was his idea to begin the undertaking of a great Arabic dictionary.

A collaborator with Worthington, and also incumbent during part of his life, was Ralph Cudworth, the vicar of Ashwell, west of Royston, between 1662 and 1668. He spent much of his life in Cambridge, first at Emmanuel and then as Master of Clare in 1645 and Master of Christ's in 1654. Cudworth became a leader among the group generally known as the Cambridge Platonists. Among his contemporaries at Emmanuel were Nathanael Culverwel, John Wallis, the famous mathematician, Benjamin Whichcote and John Worthington.

At the Restoration, Cudworth contributed a copy of Hebrew verses to the 'Academix Cantabrigiensis', a volume of congratulatory poems to Charles II, expressing sentiments similar to those of Castell. In 1662 he was presented by Bishop Sheldon to the rectory of Ashwell, Hertfordshire⁵

No list of Castell's contemporaries and predecessors in Cambridge can leave unmentioned the occupant of the Chair in Arabic before him, Abraham Wheelocke (1593-1653), one of the early pioneers in Oriental studies, who urged,

(Sir) Thomas Adams (1586-1667) to induce some city company to endow a chair of Arabic at Cambridge. This Adams declared to be impossible; but he offered to provide a stipend of £40 for such a purpose for two or three years, Wheelocke to be the first professor, and he afterwards made this endowment permanent. Wheelocke appears to have both taught and studied Arabic diligently, and in Adams's letters to him (preserved in the Cambridge University Library) there are frequent references to his 'Arabic mill'; but he published little or nothing bearing on the subject, owing, he says, to the want of Arabic types and compositors capable of setting them up. In a letter to Ussher dated 1640 he mentions that he had prepared a refutation of the Koran, but that the missionary to whom he had shown a specimen of the work had discouraged him from proceeding with it.

Wheelocke also took part in drawing up the plan of Walton's *Polyglot*, and wrote a letter to the vice-chancellor of Cambridge University, commending that work, of which he was to have corrected the Arabic and Persian texts, but death prevented his executing much of this scheme.⁶

Sir Thomas Adams himself, although born in Shropshire and who spent much of his time in London, was buried in the church of St Mary and St Margaret, Sprowston, outside Norwich. His monument, with its lengthy Latin inscription, perhaps inspired Castell's own monument in Higham Gobion church.

Adams is linked with the Orientalists of the Cambridge region, primarily, of course, through the endowment of the Arabic chair in the University. His Arabic interests figure prominently in the inscription which reads, translated:

Thomas Adams and his most gifted wife lie beneath this marble tomb. He was a Scholar, Lord Mayor of London, a Member of Parliament and at one time a most renowned Minister. He served his country as a Soldier and Baron, dispensed justice sincerely, championed the orphan's cause, and acted as a Governor of St Thomas' Hospital. His home and birthplace was Wem in Shropshire, where he was a diligent schoolmaster. He was a most worthy student and patron of Cambridge University, and endowed Arabic lectures from his own income. He always opened his hands to the poor, his doors to strangers, and his intellect to students of the arts. He was a man of absolute trust and integrity, who stood out in a dark age. He was held in the Tower of London, but preferred imprisonment rather than offend his conscience and denounce the King. He showed himself a man of zeal as a London magistrate, a distinguished member of the Wool Guild, and a Minister at the Treasury. Thus he lived for 80 years doing good, despite having suffered the most awful torture which he bore for 15 years. With his patience undefeated he died on February 24th, 1667, released from the burden of this life and raised to the bliss of heaven.

His sweet wife bore him five sons and four daughters from whom there are three granddaughters and one grandson. He, it is, Jules, baron and heir, who has erected this monument to his dear parents⁷

Sir Thomas Adams also had land to the south of the city of Cambridge. He owned property in North-West Essex, between Saffron Walden and Bishops Stortford. In his will, dated 1667/1668 there are references to property in Broxted, Manuden and Strethall, including one specific reference to the manor of Chawreth Hall, Broxted, still shown on the Ordnance Survey map half a mile to the east of Chickney church, and land called Hinkley, Broxted, maintaining a £40 annuity for an 'Arabique Lecture' at Cambridge University. This bequest must refer to that recorded in the *Dictionary of National Biography*:

He also founded the Arabic Lecture at Cambridge, to which he gave L40 a year for ever, and, at the instigation of Mr Wheelocke, the first reader of Arabic, bore the expense of a translation of the Gospels into the Persian language for circulation in that country with a view to the conversion of Mahometans.⁸

(B) The Christian Mission Of The Orientalists

This last quotation shows how important were the religious aims of certain the Orientalists. As Professor of Arabic, A. J. Arberry in his inaugural lecture on 30th October 1947, entitled *The Cambridge School of Arabic* drew attention to this.⁹ In 1636, it was the view of the Vice-Chancellor of the University that



2. The monument in St. Mary and St. Margaret Church, Sprowston, Norfolk, to Sir Thomas Adams, who endowed the first Arabic Professorship at Cambridge.

the development of Arabic studies could serve three distinct and important purposes: literary, or, as Arberry suggests, scientific, commercial including political, and religious. Note, however, the order of these priorities. Arberry quotes the letter written to Thomas Adams by the Vice-Chancellor and Heads of Colleges on 9th May 1636, which, in its contents lists the University's aspirations:

The worke itself was conceived to tend not onely to the advancement of good Literature by bringing to light much knowledge which yet is lockt up in that learned tongue; but also to the good service of the King and State in our commerce with those Eastern nations and in God's good time to the enlarging of the borders of the Church, and propagation of Christian religion to them who now sitt in darkness.

Wheelocke's commitment to mission has been mentioned. Edmund Castell, his successor, was seemingly more introspective. His goal was heavenward, as the Arabic inscription on his epitaph declares, 'in the hope of the City that is better than that [in this world]. Dedicated to strengthening the links with the Eastern churches, and seemingly indifferent to the formidable challenge of Islam itself, which merits little mention anywhere in his writings, it is first of all the translation of the scriptures into Eastern tongues which fired his enthusiasm, and, at the same time determined his study as a lexicographer.¹⁰

There had always been a split in the thinking of the Christian world about the Arabians. Arabia in Christendom, was not only *Deserta* but *Felix*. This duality dated back to the Middle Ages, even before the Crusades. It left its mark on the York and Chester Mystery Plays, upon Chaucer and upon the thinking of the schoolmen and the scholastics. *Arabia Deserta* evoked the image of Hagar's Ishmael and Mahound, that false prophet, *par excellence*, whose Alcoran required translation, then study, then refutation, after which Arabia's desert ranger, it was hoped, would bow the knee to the Nazarene in worship. *Arabia Felix* evoked another image altogether. First of all there was the Queen of Sheba, whose arts bewitched wise Solomon, King of Israel, and about whom Handel wrote, in his libretto to his oratorio, *Solomon* (1748):

From Arabia's spicy shores
boarded by the hoary mains
Sheba's queen these seats explores
To be taught thy heavenly strains.

This vision was taken up again in the persons of the Magi, or at least one of them, Melchior the Wise, seer, star-gazer and adoring king who had already bowed the knee. More important than all of these was Job, the Arabian. He

was neither an alien from *Arabia Deserta* nor from *Arabia Felix*, but was one of the major established figures of Holy Writ in Christendom. In a letter dated 14th April 1624, sent to Wheelocke by Foorth (Cambridge *Dd.3.12*, p. V.6), the latter remarked, 'The Arabick will be a great help for opening the native signification of some few words in Job who was an Arabian himself, otherwise arabick words are either few or rare in the rest of the Scripture'. *Arabia Felix* and Ethiopia were clearly close neighbors. The link between *Arabia Felix* and Chaldea and Persia was, in part through their association in the same Wise Men, in part through the Old Testament, and in part through the lands being remote, exotic and esoteric. Despite the commercial contact between Christendom and Islam in the seventeenth century and despite the Renaissance and the great strides made in Oriental learning, some of these notions, from an earlier age, lingered on, and still linger.

They are by no means absent from the writings of Edmund Castell—nor, for that matter, from part of Walton's *Polyglot*—but by a mixture of unabated zeal, misguided enthusiasm and sheer scholarship, Castell succeeds in carrying us with him into his Arabia, although it is as individual and unreal as Walter De La Mare's.

Take, for example, his forty-page inaugural lecture on the merits of the Arabic as exemplified by the interpretation of the *Canon* of Avicenna, *Oratio ... in secundum canonis Avicennae Librum* published by Thomas Rycroft (London, 1667). It was included in Kapp's 'Clarissimorum Virorum Orationes Selectæ'.¹¹ This bizarre lecture appeared just before the final publication of the *Lexicon Heptaglotton*, to which a passing reference is made, and which is also full of flora and fauna. It offers an insight into Castell's interests; why he held the Semitic tongues in such regard; and more especially, what he saw as the prime object of his labours and those of his colleagues both in England and on the Continent. For example, he remarks (*Oratio*, p.9):

But to move from places to the language which in all of them especially obtains, discourse is quick with Arabic. About whose antiquity, breadth, agreeableness, readiness, necessity and utility for absolutely all pursuits—logic, arithmetic, history, chronology, drama(?), ethics, philosophy, mathematics, medicine, astronomy and theology, three orations of Erpenius may be consulted; further, there are also CI [Clarissimus?] Pococke, the famous Dr Tho Greaves, Matth Passor [sic], Vitus Wolfri and the others who are everywhere offered praise in this context of language.

The richness of Arabic could be illustrated by the forms and patterns of its words, such as participles and nouns, which were derived from its verbal roots, some forms denoting habitual action or something highly specific or a temporary status: thus *qāṣira* denoted a woman who restrained her eyes from

looking at any other person but her husband, while *rubṣa /rabṣa* (sic Castell) indicated, to cite Lane, 'a period which is assigned to a husband when he has been pronounced incapable of intercourse with his wife, so that if he go to her (it is well with him and he may remain her husband); but if not, a separation is made between them'. Myriad Arabic forms and strange meanings filled the lexicons, and not only Arabic lexicons, since the Syriac fathers and the storehouses of learning and wisdom of the Chaldeans, the Medes and the Persians were also inexhaustible founts of learning, inspired, ultimately, by the Creator Himself.

Plants, herbs, remedies, soils and substances which appeared in Ibn Sīnā (Avicenna) and in other Arabic works which drew upon the Classics—those *Materia Medica* the Arabs would class amongst the *ḫawāṣṣ al-aṣhyā'*—are discussed extensively between pages 16 and 23. Some names are Arabic, others Persian, some derived from Greek. Castell debates what plant or shrub or tree or drug is meant and what light could be shed on holy writ by comparative study were it appropriate or relevant.

Amongst the plants mentioned by Castell, derived from Avicenna are: *zarnīj/darnij*, *darwanj* (*doronicum* or leopard's bane); *ḥabb al-sumna* identified with *paliurus* or Christ's thorn, *azāddarakht* with *ceterach* or a species of fern, *qulqās* with *colocasia*, which is described by Lane in his *Lexicon* (1863) as 'arum colocasia, the root of a certain plant, which is eaten cooked, and used medicinally'; *riḥāqīn* is identified as *cæpa ascalonica* and *ṣāmīrjūna* is identified by Castell as *spina graeca*, tracing the name to ancient eastern tongues and finding that the Arabic form had passed through Spanish. These interests of Castell should be seen as supplementing research undertaken in Africa and Asia by expatriots for the enquiring at home, as is apparent, for example, in a letter dated 24th November 1681. It is sent by Wyld Clarks, agent in Ifni in Southern Morocco, to John Aubrey, and cited in the latter's *Three Prose Works*¹²

Elsewhere, Castell relates his studies wider to Holy Scripture. On page 26, he questions the authorized version of *Habakkuk*, 3.17, 'Although the fig tree shall not blossom'. He cites the Arabic *inna'l-tīna lā taḥmilu thamaratan* to show that, here, fruit is meant, giving backing, in fact, for the translation of the verse in the recent *Good News Bible*, 'Even though the fig-trees have no fruit and no grapes grow on the vines'. On page 29, Castell finds that 'the perfume of myrrh and aloes is on your clothes' mentioned in Psalm 45, verse 8, relates to the Arabic, *rad'*, saffron, and similarly to *taraqquṇ*, 'dying with henna'. He concludes with matters of theology, to show/emphasize how both Arabic and Chaldean shed light and knowledge to the vision in *Numbers* that 'a king like a bright star will arise in that nation (of Israel)'.

(C) The London Polyglot of Bryan Walton (1657)

In his article on the Oxford Arabist, Edward Pococke (1604-91), P. M. Holt, noted the part which he played in this major linguistic project of English Orientalism in the first half of the seventeenth century.¹³ Holt pointed out, however, that this *Polyglot* was not the first of its kind but only the latest of a series which were published in Western Europe. Like its predecessors, the Complutensian (1514-17), Antwerp (1569-72) and Paris Polyglots (1628-45), the English Polyglot was a product of the biblical humanism of the Renaissance; unlike them, it was the work of Protestant scholars.

Bryan Walton, later Bishop of Chester, was educated at Cambridge, at Magdalene and at Peterhouse, though he went to Oxford in 1642, but his project to achieve the publication in England of his *Polyglot Bible* entailed the continuous participation of several Oriental scholars, both in Oxford and outside it. It was in Oxford that he seems to have acquired some knowledge of Oriental languages. According to the *Dictionary of National Biography*:

Nine languages are represented in the work, but no single book of the Bible appears in more than eight versions. The correcting committee consisted of Stokes, Wheelock, Thorndike, Pococke, Greaves, Vicars, and Thomas Smith; on the death of Wheelock in 1653, Hyde was substituted for him. Lightfoot ... was invited to take part in the work of correcting, but declined; much was done by Castell, whose 'Heptaglot Lexicon' afterwards formed a valuable supplement to the *Polyglot* and who, though given an honorarium by Walton, complained that his services had not been adequately acknowledged. Several other scholars had a hand in the work. ... Walton, however, claimed responsibility for the whole, and provided it with prolegomena giving a critical history of the texts and some account of the languages which they represent.

Something further will be said about the London *Polyglot Bible* in my conclusion.

(D) The Lexicon Heptaglotton

Castell's *Lexicon Heptaglotton* has been viewed as a 'supplement' to Walton's *Polyglot*. Is this how Castell viewed it himself? Certainly in an undated letter, addressed to His Highness the Lord Protector, signed by himself together with Alexander Huish and Samuel Clarke, it is apparent that the purpose of the *Lexicon* was to offer an original work in its own right:

That whereas by the good hand of God, upon the unwearied labours of the publishers of the great Bible in many languages, the same is now very near accomplished, to the Glory of God, and the great Honor and benefit of this nation, the like never having been before performed. And for as much as there is no lexicon extant for all these languages together, and for some of them not

at all, without which that most excellent work cannot be so useful, as otherwise it might be, your petitioners (who have long addicted themselves to the study of those languages, and have been all along assistant to ye worde of the Bible, and thereby had the more opportunity to observe the propriety and use of words therein) have upon the request of divers persons of worth and learning undertaken the composing and publishing of such a work, wherein the labours of former lexicographers ar cheaper rate, than some lexicon of one language, could heretofore be had. may be completed by their observations, and the same be had at a far cheaper rate, than some lexicon of one language, could be had.

The request concludes with an appeal for the import of five thousand reams of royal paper, excise and custom free.¹⁴

Even if it be conceded that Castell 'trod in the footsteps of Bedwell's Lexicon', the *Lexicon Heptaglotton* is a magisterial work of some 4007 pages. It opens with a somber portrait of Castell himself. Acknowledgements to famous Orientalists follow, with homage to King Charles II, and a Preface wherein Bedwell is praised along with others of his Orientalist fellow countrymen. Scholars in the Low Countries and in Italy are lauded, for their labours, in Armenian Coptic and Turkish. Sources used are cited. They include Arabico-Samaritan liturgies, Arabic manuscripts of the Gospels, and Wheelocke's Persian Gospel. The Ethiopic sources are likewise mentioned. An Errata follows, then a series of alphabets, differing little from those in Walton's *Polyglot* except for the format. The Semitic alphabets and the Persian are reproduced here in long columns. This is followed by a detailed grammatical description of Arabic, Ethiopic, Samaritan, Syriac, Chaldean and Hebrew, often side by side. The derived forms I-IV of the Arabic Verb are explained with a greater density of detail than forms V to XIII. All the weak verbs are separately treated. The Lexicon itself is arranged according to the Hebrew alphabet and each entry is filled with disparate information, including geographical localities, dialectal forms, flora and fauna. For example, on page 3947, 'TRK' is not only explained as a Semitic root indicating 'abandonment', but also as the races of Turcicus and Turcomanni. A few fragments from the *Qur'ān* are cited, which itself is entered under 'QR', *Alcoranus a collectione capitum quæ primum dispersa erant ut diversis temporibus a Muhammade promulgata*. Elsewhere *Sūrat Yūsuf* 12. 69 is quoted and Bedwell's name cited as the source. Some entries, for example, *Malak*, 'angel', are very extensive. *Iblis*, *Diabolus*, is described as *Beelzebub in Alcorano* and again Bedwell's name is cited. Throughout the work there is citation of Avicenna's writings, thereby linking the *Lexicon* to selected passages already mentioned in Castell's *Oratio*.¹⁵

The quantity of the material is enormous, the meticulous referencing, despite the highly unsatisfactory format of Castell's bizarre writing and the

printing, is remarkable though often the choice of word and comment strikes one as arbitrary. In contrast, the nineteenth-century *Lexicon* of E. W. Lane is far removed in intent from Castell's *Lexicon*. The latter showed little if any influence from Arabic lexicons in the substance quoted. There is no citation from Arabic verse either and no systematic description of Arabic roots and the innumerable vocalic forms which stem from them. These are a handicap, though Castell was not alone. E. W. Lane wrote on pages xxv-xxvi to the Preface of his *Lexicon*:

Of the learning of Golius and the industry of Freytag, I wish to speak with sincere respect, and with gratitude for much benefit derived by me from their works before circumstances gave me advantages which they did not enjoy. But lest I be charged with omitting important matters in some of the originals from which my work is composed, it is necessary for me to state that, in countless instances, both of these lexicographers have given explanations, more or less full, as from the *Šihāh* or *Qámoos* or both, while not one word thereof, nor even an indication, is found in either of those originals; and that matter of what Freytag has given as from the *Qámoos* is from the Turkish Translation of that lexicon, of which I have before spoken, a work of considerable learning but of no authority when no voucher is mentioned in it.

It is interesting, however, to compare the *Lexicon Heptaglotton* with the far better printed and arranged *Polyglot* of Walton. Here may be found printed parallel passages of Holy Writ in Arabic, Ethiopic and Latin with a minimum of lexicographical data. Yet for Arabists, Volume I of Walton's *Polyglot* (Prolegomena XIV, pp. 93-97) contains information of interest left unsaid in Castell's *Lexicon*. It draws upon those ideas put into writing at greater length by Pococke and by Samuel Clarke. Arabia and Arabic, we are told, began in Arabia Felix. The Arabs are descendants of Sheba, whilst the Saracens are 'men of the Orient (*sharqiyyūn*), and are not the offspring of Sarah. Muḥammad, illiterate Prophet (*nabiyyan ummiyyan*), was born amongst the Quraysh. The southern Arabs had their own script and alphabet, the Musnad of the Ḥimyarites. The ancient Arabs were men who boasted of their genealogies and who took pride in their early bardic poetry. These bards were like the Druids, we are informed, brothers to the seers of Ancient Britain and Gaul. Arabic spread as the Arabs, and later the Muhammadans spread, westward to the land of the Garamantes and ultimately to Spain and to Morocco, and eastward towards India and the Indies, heavily influencing the Persians and the Turks. The biographer, Ibn Khallikān, receives a mention amongst other Muslim writers. Arabic was and is a rich literary language, the source of knowledge derived from the Greeks and the heritage of the Arab Christians of the East.

CONCLUSION

The lexicographical labours of Castelli and of Walton amongst the Arabists of the seventeenth century, as we look back in time from a long period of Orientalism in this country, may to us, appear marginal to the absorption and translation of the literature of the heartland of the Muslim World. The study of Islamic and non-Islamic texts conditions and defines our comprehension of the Arab East today. A textual study of Arabic centered on an understanding of the Bible is no longer so easy for us to comprehend. Yet the learning of Arabic, as one amongst the other Semitic languages, acquired with a view to a better comprehension of God's Word, is what we owe to these Orientalists. Castelli is amongst them, even if, in some ways, his efforts seem pointless and retrogressive. Something of this seventeenth-century tradition survived. It influenced, for example, the pioneer thinking and the writings of W. Robertson Smith in his Burnett Lectures of 1888-89. In the preface to the first edition of his classic *Lectures on the Religion of the Semites*, he remarked:

The value of comparative studies for the study of the religion of the Bible was brought out very clearly, two hundred years ago, by one of the greatest of English theologians, Dr John Spencer, Master of Corpus Christi College in Cambridge, whose Latin work on the ritual laws of the Hebrews may justly be said to have laid the foundations of the science of Comparative Religion.¹⁶

I would like to conclude with one example to illustrate the overlapping interest of these scholars. Arabists and others are familiar with the story of the wandering poet-king, Imru'ul-Qays of Kinda, who was uncertain of the way he could avenge his father. According to Charles Lyall:

That Imra-al-Kais was himself a heathen there can be no doubt: this is plain not only from his name—'the man of al-Kais', a deity among the pagan Arabs—but also from his visit, before he set out northwards with his Himyarite troops against Asad, to the temple of the oracle Dhu'l-Khalaṣah in the valley of Tabālah north of Najrān, belonging to the tribe of Khath'am. This oracle was consulted, as usual at all such shrines in heathen Arabia, by shuffling before the image of the god a set of arrows; these were here three in number, called respectively 'the Commanding', 'the Forbidding', and 'the Waiting'. He drew the second, and thereupon broke the arrows and flung them in the face of the idol, saying 'if thy father had been slain, thou wouldst not have restrained me'.¹⁷

This story was not unknown to the seventeenth-century Orientalists. In the pages of Walton's *Polyglot* and in the entries in Castelli's *Lexicon Heptaglotton*, there are allusions to parallels to Arabian custom in Old Testament lore. Attention in this instance is drawn to *Ezekiel*, 21.21 which, in the *New English Bible*, reads:

Then carve, a signpost, carve it at the point where the highway forks. Mark out a road for the sword to come to the Ammonite city of Rabbah, to Judah and to Jerusalem at the heart of it. For the king of Babylon halts to take the omens at the parting of the ways, where the road divides. He casts lots with arrows, consults teraphim and inspects the livers of beasts. The augur's arrow marked 'Jerusalem' falls at his right hand: here, then, he must raise a shout and sound the battle cry, set battering-rams against the gates, pile siege-ramps and build watch towers.

These early Bible-schooled Orientalists, and their writings, have still something to tell us, if we read with care and patience those works which they labored to complete; some milestones, others blind alleys, along the road to the multivariied disciplines which together make up Oriental and African studies as we know them today.

NOTES

I am grateful to my friend David Poole for the rendering of the curious Latin original from Avicenna's *Canon*, Book II, quoted on pp. 3 and 14.

¹ Ivan O'Dell, 'The gift of tongues. Edmund Castell of Higham Gobion (Bedfordshire biographies 10)', *The Bedfordshire Magazine*, (1950), 11, pp. 189 ff. For a fuller bibliography see H.T. Norris, 'Professor Edmund Castell (1606-85), Orientalist and Divine, and England's Oldest Arabic Inscription', *Journal of Semitic Studies*, XXIX/L, Spring 1984, pp. 155-167.

² Twenty-three letters of Castell to Lightfoot, 1664-70, in *Lightfoot's Works*, ed. Pitman, 'Preliminary Matter to Volume I' of the English folio edition, (Appendix to Author's life), pp. 94-95. A further example of the manuscript hunting which took place in the Near East in the seventeenth century may be read in the correspondence with Wheelocke preserved in *Letters to Abraham Wheelocke* 1624-40, Cambridge University Library, Dd.3.12. Letter I.I is a despatch signed by Thomas Davies, dated 29th August 1624 and sent from Aleppo. It records the discovery of a sought after Samaritan copy of the five books of Moses, joined together as part of the Old Testament. The writer adds that he had sent to Damascus to obtain further copies and would enquire as far as Mount Gerizim (Nablus) if need be. He had also sent to Mount Lebanon and to Tripoli to try to obtain Syriac manuscripts. Information about the East was a tradition handed down at parish level in the sixteenth and seventeenth centuries. This was certainly true of the Eastern Counties and it no doubt was extensive in other regions of the realm. The study of Oriental tongues by the aristocracy can be observed in records about the habits of family members. The parish of Kirtling in Cambridgeshire is but one example. The chancel of this church contains a brass to Edward Myrfin who travelled in the Levant in the early sixteenth century. The inscription reads:

Here restith the cors of Edward Myrfin, gentilman, borne in y^e citie of London, educated in good vertue and lerning, traveled through all the countries and notable cities, princes courtes, with other famose places of Europe, and lykewise of y^e Iles of Greece, and so to the Turkes court, then being in the city of Haleppo, on the borders betwene Armenia and Siria, and soe returning through Jury to Jerusalem, and soe to Damasco, and from thence passing by diverse countries with sondry Adventures, arrived at length in his owne Native Citie, where shortly he endid his life, in the year of Our Lorde God of MCCCCC fifty and three, and in the XXVII yere of his age.

In the following century, in this same parish, the sister of Baron William North (who fought at Blenheim), Dudleya, was a distinguished scholar. She learnt Latin and Greek at Kirtling, though, unlike her brothers, she also studied Oriental languages. During church services she followed the lessons in her blue morocco Hebrew Bible. She died of 'overwork' at the age of thirty-seven and she was buried in Kirtling church in 1712. Her collection of Oriental books was transported to Rougham in Norfolk. As they were destroyed later by fire, unfortunately no record survives of their titles and their contents.

³ *Lightfoot's Works*, *ibid.*, p. 93.

⁴ *Remains Historical and Literary connected with the Palatine Counties of Lancaster and Chester*, published by the Chetham Society, 1897, Vol XIII, p. 242-245.

⁵ See 'Ralph Cudworth' in the *Dictionary of National Biography*, p. 271.

⁶ 'Abraham Wheelocke', *ibid.*, p. 443. Neither Wheelocke nor Castell had a reputation for any calligraphical art in the Arabic language. Little attention was paid at all to this in the teaching of Arabic in the universities at that time. In a letter sent to Wheelocke by Gilbert Wigmore, dated 27th August 1629 (Cambridge University Library, *op cit.*, Dd.3.12, V 5 (a), he remarked in regard to his friend, Mr Boise:

Mr Boise is fallen in love with Arabicke: and that which seemed before to him very difficult, now he thinketh to be easie: he can read most wordes with recourse to the Alphabethe . . . I have shewed Mr Boise your Arabicke notes and he liketh them very well wherever he could read them: but in many places we could not read them. I have now sent you them back again, because you may have use of them.

⁷ The reference to Arabic in the Latin original reads, 'Habet et Alma mater Cantabrigia cui Tanto gaudeat Filio et Patrono Prælectiones enim suis sumplibus fundavit Arabicas'. The translation is quoted from Roy W Tricker, Parish of Sprowston, Churches of SS Mary and Margaret and St Cuthbert, *A Short Guide* (1976), pp. 17 and 18. The author mentions that Sir Thomas was Lord Mayor of London in 1645. He was a draper by trade and a loyal supporter of the Royalist cause, having given the exiled Charles II £10,000, and helped to bring him home..

⁸ See 'Thomas Adams' in the *Dictionary of National Biography*, p. 103.

⁹ A. J. Arberry, *The Cambridge School of Arabic* (Cambridge: The University Press, 1948), p. 8.

¹⁰ *Lightfoot's Works*, p. 94. In a letter which he wrote to Lightfoot in 1664, when the *Lexicon Heptaglotton* was still incomplete, Castell remarked:

Sir, though I perish, it comforts me not a little to see how Holy Writ flourishes. I lately received an Armenian psalter given me by Professor Golius, come newly off the press: where they are printing, at Leyden, the whole Bible in that language. The Old Testament is there printing in the Turkish language, perfected by Levinus Warnerus. The New Testament in Turkish, done by Mr Seaman, is just now in the press at Oxford: of which I have some sheets by me: as I have also of the old Gothic, and Anglo-Saxon gospels, now printed with a glossary to them at Leyden. Mr Petreus hath printed some parts of the Old Testament in Ethiopic, and hath many more prepared both in that at the Coptic language.

¹¹ According to Stanley Lane Pool's biography of Castell in the *Dictionary of National Biography*, p. 272, 'Some marginal manuscript notes of Castell's are preserved in the copy of Plempius' *Canon* of Avicenna (1658) in the British Museum', which I have not had an opportunity to examine.

¹² John Aubrey, *Three Prose Works*, edited with introduction and notes by John Buchanan-Brown (Fontwell, Sussex: Centaur Press Ltd), p. 484:

as to Said Inquiry desire[d] about the plant Surnag, I cannot find any plant bearing that

name known to the Moors. A minerall there is which they make use of to dispilliar the secret parts of their women. If Said Inquiry had hinted Some of its virtues, I might have better gott light of it; & as for Poysons, all arte with them is utterly lost, & they know no Certainer then Mercury, which I have often bin solicited for by them, & by Severall, to informe them if [I] know any way. . . . As for your Granum Nubiæ, it being a Latin word none here understand it, but I cannot find by strict inquierie of Moores & Jews any thing to have Such vertues. Sir, if you had given me the way of preserveringe Alhenna [?] fitt to plant, could have what I will. If per next you give your selfe the trouble, I shall observe the Method & also as to other plants and berries & bring with me next Summer, then intending for England.

¹³ P. M. Holt, *Studies in the History of the Near East* (London: Frank Cass, 1973), p. 14. Also see the comment on the debt owed by Castell to Bedwell in Alastair Hamilton, *William Bedwell the Arabist (1563-1632)* (Leiden: E J Brill, 1985), pp. 93-94.

¹⁴ Cambridge University Library, Baker MSS Vol 36, 1, *MM1.47*, pp. 349-50.

¹⁵ The copy of the *Lexicon Heptaglotton* to which I have referred is to be found in the Town Library, Saffron Walden, RL 7 2110, donated by G. S. Gibson, a great benefactor to the town. I have also referred to the extracted *Lexicon Syriacum* (S.W. Library No 72108) with addenda by Joannes David Michaelis (Gottingen, 1788) and *Dictionarium Persico-Latinum*, separate to the *Lexicon* itself (S.W. Library No. 72108). I am very grateful to the librarian and his colleagues for their assistance. Despite the limited number of copies of the *Lexicon* that were published, the distribution of copies of the work in libraries, colleges and private collections is very wide. For example, in Sarajevo, in Bosnia, Yugoslavia, I have been shown the copy of the *Lexicon* in the Orientalni Institute. The copy is in excellent condition and it is a prized possession of this institute which is, devoted to the study of Arabic, Persian and Turkish language, literature and the religious sciences in Muslim Bosnia and Herzegovina.

¹⁶ Preface to the First Edition, 1899, p. vi.

¹⁷ Charles James Lyall, *Translation of Ancient Arabian Poetry* (1930), p. 106.

ROBERT JONES

THE MEDICI ORIENTAL PRESS (ROME 1584-1614)
AND THE IMPACT OF ITS ARABIC PUBLICATIONS
ON NORTHERN EUROPE

At Rome between 1590 and 1595 seven Arabic texts were published by the *Typographia Medicea* under the direction of Giovan Battista Raimondi.¹ Two of these were Christian Arabic texts issued in Arabic and bilingual Arabic-Latin editions; the other five were scientific Arabic texts written some centuries earlier by Muslim scholars and issued in single monolingual editions. They were, in order of publication:

1590/1: The *Gospels* in an unidentified Arabic version with the wood-cut illustrations of the life of Christ designed by the Florentine painter Antonio Tempesta in two different editions, the first in Arabic alone² and the second with an interlinear Latin version made by a team of translators working for the press.³

1592: Two thirteenth-century tracts on Arabic Grammar that were very well-known in the Ottoman and Arab Worlds: *al-Kāfiya* by the Egyptian jurist and grammarian Ibn al-Ḥāḥib;⁴ and *al-Muqaddima al-ājurrūmiyya*, so-called after its Moroccan author Ibn Ājurrūm, also known as al-Ṣanhājī, who, according to tradition, composed this quintessence of Arabic syntax at Mecca with his face turned towards the Kaaba.⁵

1592: *Nuzhat al-mushtāq fi dhikr al-amṣār* . . . ('The jaunt of a man who loves recollecting capital cities, regions, countries, islands, towns and distant lands') being the anonymous abridgment of al-Idrīsī's descriptive geography, which he wrote in Sicily in the twelfth century for the Norman King Roger II.⁶

1593: The great tenth/eleventh-century medical work from Iran, Ibn Sīnā's *al-Qānūn fi al-ṭibb*, which had already become so well-known in the West as Avicenna's *Canon*, together with his philosophical work *Kitāb al-Najāt* ('Book of Salvation [from Error]'), which is his own selection of extracts from his important compendium, *Kitāb al-Shifā'* ('Book of Healing [of the Soul]').⁷

1594: Euclid's *Elements* in an Arabic recension attributed to the thirteenth-century astronomer and mathematician from Khorasan, Naṣīr al-Dīn al-Ṭūsī, and illustrated by numerous fine wood-cut diagrams.⁸

1595 *I'tiqād al-amānah al-urtūdūksiyyah*, the confession of faith for eastern Christians by the Jesuit orientalist Giambattista Eliano in three different editions, two of which contain the Latin text with an Arabic version while the third gives the Arabic alone⁹

Excepting Eliano's confession of faith,¹⁰ these books are all first editions. Also dating to the 1590s are two other books published by the Medici Oriental Press: one, the *Alphabetum Arabicum* of 1592, is an introduction in Latin to the Arabic alphabet and the phonetic values of its letters with many examples in Arabic and a syllabary¹¹; the other is a Missal in Syriac and Karshūni dated 1592-4.¹²

What is so impressive about these Arabic books is that they seem curiously ahead of their time both as artifacts and as sources for European scholarship. On the one hand, these were among the very earliest books printed in Arabic by means of moveable metal type,¹³ yet their reproduction of the cursive Arabic script seems more accomplished and more elegant than many other contemporary and subsequent European Arabic printings. Moreover, their design as books has more in common with the manuscript format adopted by the Mūtefferika Press in Istanbul in the eighteenth century or by certain Indian and Egyptian publishers in the nineteenth century than with the appearance of European printed books from around 1600. On the other hand, however interesting their texts may have been to European scholars, very few had the ability to read them. So who read such precocious and freakish publications and why were they produced?

This essay will first discuss the reception and use of these Arabic publications by other contemporary European scholars, especially in the North, including England; and then it will reconsider to what extent the management of the Medici Press wished to play a part in the revival of European Arabic studies.

I

In Central and Northern Europe contemporary scholars received the Medicean publications with mixed feelings. They registered admiration for the massive financial investment undertaken by the founder, Cardinal Ferdinando de' Medici, and for the superb technical skill of the type-cutter. At the same time they expressed surprise at the peculiar priorities of the scholars who sat on the editorial boards. The choice of texts seemed insensitive to European requirements when the only didactic tools available in print were Pedro de Alcalá's grammar and lexicon of the Andalusian Arabic dialect, published at Granada in 1505,¹⁴ or Guillaume Postel's patchy analysis of Standard Arabic (and its

insubstantial derivative studies).¹⁵ Efforts should have been concentrated on producing a comprehensive grammar book and a dictionary, not unvocalised editions of difficult technical texts. A further criticism levelled at the press was that these texts had been marred by an excess of printing or editorial errors.

Here are some of those scholars' judgments. Inevitably they reveal quite as much about themselves as about the press in Rome.

In a book published at Frankfurt in 1590, the German scholar Jacob Christmann, who found it impossible to acquire Arabic type, responded with admiration and expectation to the achievement in Rome:

At Rome in 1589 [*sic*] Pope Sixtus V [*sic*] established an Arabic press from which the Avicenna, Euclid and Four Gospels were issued. These books have been printed with such beautiful type that the shape and joining of the Arabic letters offer a superb match to manuscripts. Once somebody has made a move in the direction of type which can accommodate the vowels and with which Arabic grammars and dictionaries can be published, there is no doubt that within a short space of time the whole of Europe will be adorned by the Arabic language.¹⁶

At Leiden in 1595, the scholar-printer Franciscus Raphelengius praised the founders of the Medici Press for their investment in what he assumed was a commercial enterprise directed towards an eastern market (a subject to which we shall return), but lamented their neglect of European needs. The memory of his own difficulties is still fresh:

Many years ago when I embraced the study of this language I realised there was nothing to encourage readers in this and I lamented the lack of anyone able to promote the matter. There were a few who made some attempt and no doubt they would have made progress had they not been put off by the expense. At last, however, after many years of expectation, it occurred to some eminent men to establish a printing press at Rome replete with the most elegant type. From the subsequent publications it is quite obvious that they spared no expense to equip the press. While these efforts became more famous by the day, the hope was that they would produce something from the excellently appointed workshop that would answer the needs of students. Prestigious and highly influential printed works in Arabic were published with such elegance that I can confidently say that nothing could be added in the way of greater embellishment. Yet most people passionately complain that they do not slake the thirst of our still ignorant Europeans. It is possible to conclude that they had nothing else in mind other than to serve the Arabs, especially the Christian Arabs, with their efforts, and were induced by the hope of gaining maximum profit from the books they printed. And although their intention is highly praiseworthy it would have been much more acceptable if they had taken into account the value to our men too by publishing the beginner's grammar and a lexicon that they promised from the start. It was for this reason that I was inspired to have some characters cut in imitation of theirs so that westerners would sometime enjoy the same benefit

as I saw the orientals had from the Italians.¹⁷

Around 1604, in a dedicatory epistle to King James I (and again, two years later, in an epistle to his friend, Lancelot Andrewes), William Bedwell, 'the father of Arabic studies in England', singled out his European predecessors and contemporaries for their praiseworthy efforts in this field, but complained that, despite this, little had been achieved.

...some have toiled a great deal in these studies but left little to posterity; others have published a certain amount, but clearly to no avail or of no advantage to others. Only those who were helped by the support of Cardinal de' Medici have produced something praiseworthy and greater by far than every expectation: yet it was not intended by them for the general benefit of students but for themselves. Many have promised an Arabic dictionary, several have tried, everyone has awaited, but no one has achieved anything yet.¹⁸

By this stage, Bedwell had indeed completed draft versions of an Arabic dictionary and even considered approaching the Medici Press, which he mistakenly thought was in Florence not Rome, to print it.

The French ambassador to Istanbul, François Savary de Brèves, who founded his own printing press at Rome in the last years of the Medici Press, represented an unwelcome challenge to their monopoly. In his criticism of their edition and translation of the *Gospels* displays the same candour he employed in dealing with other rivals. According to him, that edition was 'so badly [printed], so far from the sense of the Arabic that to tell you the truth everything they have done is wrong'.¹⁹

Nor was the great Dutch Arabist, Thomas Erpenius, averse to criticising his competitors for the sake of his own advancement. The reputations of Peter Kirsten, the Avicennist at Breslau, and Jan Theunisz, the liquor-selling Arabist who spent a probationary year teaching Arabic at Leiden, have both suffered as a result of Erpenius' competitive spirit.²⁰ But in his judgment of the Medicean *Ājurrūmiyya*, he reveals his own exacting standards as a grammarian rather than any personal animosity:

This little book was published one day at Rome at the Medici Press with very elegant-lettering but quite incorrectly with omissions here and there not so much of [individual] words but of whole sentences.²¹

Elegant, faulty, and insensitive to European needs—these same verdicts can as easily be arrived at today. Connoisseurs of fine typography will agree to marvel at the typographical elegance of the books; and when they hear that the greatest type-cutter of the time, Robert Granjon of Lyon, worked for the press in the final years of his life, their pleasure is explained.²² By the late sixteenth century when type cutting skills had already been developing for a century and a half, fine Arabic typography could spring in a mature form from the

European printing tradition as a whole. As the Medicean Arabic books demonstrate—and as indeed does the recently rediscovered Venetian Qur'an printed by Paganino and Alessandro Paganini in c.1538²³—provided a craftsman of sufficient skill was found and funded, the technical difficulties of printing a cursive script could be overcome in a way that was convincing (to Europeans at least). For Jacob Christmann and most other Arabists of the sixteenth and early seventeenth centuries, the problem of printing Arabic was not so much technical as economic. Fine Arabic printing required substantial patronage. So when Cardinal Ferdinando de' Medici, the future Grand Duke of Tuscany, invested in Granjon's skills, the result was so impressive that it set a standard for Arabic printing which was followed not only by Raphelengius and Erpenius but by many other printers in the West for centuries to come.

As for the charge of inaccuracy, readers of Arabic can easily confirm that there are misprints in these editions. But whether these errors are as widespread or serious as Savary de Brèves claimed cannot be determined until the editions and their manuscript exemplars are examined in detail. To date only the slightest of the books, the *Ājurrūmiyya* has undergone such an examination.²⁴ The more substantial texts await close inspection.

Leaving aside the typographic aspects of the press, which have received close analysis elsewhere, and the editorial, which have not, the third charge of insensitivity to European needs deserves special attention in the context of this collection of essays. It is easy to concur with the contemporary view of the Medicean publications as indulgent and disappointingly unsuitable for European requirements. If, as Raphelengius assumed, the press had more exotic markets in mind—and we shall be returning to the intentions of the press in the second part of this essay—then we should ignore the criticisms of its choice of publications and concentrate instead on the actual use to which they were put in Europe. For whatever the priorities of the press may have been and whether or not the books were intended or suitable for inexperienced students of Arabic, there is no doubt that they provided an important stimulus to the revival of interest in Arabic sources that took place around 1600 when Arabic texts, both manuscript and printed, were hard to obtain.

Hand-written annotations in extant copies of the Medicean Arabic books, now in European libraries, show how carefully they were read by their owners. In Leiden, for instance, there are those that belonged to Joseph Scaliger, in Amsterdam there were Matthew Slade's, in Groningen Jacob Christmann's, in Paris Etienne Hubert's, in Hamburg Peter Kirsten's, in Vienna Sebastian Tengenagel's, and in London Isaac Casaubon's.

In the absence of any sustained Arabic lexicographical and grammatical traditions in Europe, learning to read and understand these Arabic books was not an easy task. Nonetheless, with some determination and ingenuity they

could be used, in the first instance, to improve the scholar's knowledge of Arabic. Obviously, the bilingual editions of the Gospels and Eliano's Confession of Faith provided an immediate source of Christian Arabic vocabulary in the same way that the Arabic text in Agostino Giustiniani's polyglot Psalter, published at Genoa in 1516, had done earlier in the century for Nicolas Clenardus and Wolfgang Musculus.²⁵ As for the monolingual Arabic texts, two of the five texts, the *Canon* and the *Elements*, had for long been available in the West in the mediaeval Latin versions by Gerard of Cremona and Adelard of Bath. Both texts, as revised by Andrea Alpago and Campanus respectively, then became widely available in printed editions.²⁶ The *Elements* was also available in Greek editions. It was possible, therefore, to gain a knowledge of the Arabic texts by reading them in conjunction with the Latin (or Greek) versions; and in the case of the *Canon* at least, there is evidence that this kind of comparison was made. Even the editors of the Arabic text of the *Canon* compared it with one of the printed Latin editions.²⁷ Joseph Scaliger annotated his copy of the Medicean *Canon* with reference to Gerard's Latin version,²⁸ as did Etienne Hubert.²⁹ A copy of the Latin version printed at Venice in 1564 and now in the British Library was annotated in Arabic through reference to the Medicean text.³⁰

Not that this circular method of comparing newly acquired texts with old translations could provide the return *ad fontes* and new interpretations that many Renaissance Arabists desired. But in the absence of Arabic—or Turkish—speaking informants able to interpret the works of the great Muslim lexicographers, the Medicean publications used in conjunction with existing Latin translations offered a rich supply of vocabulary, both religious and scientific. William Bedwell compiled parts of his Dictionary in this way: his first specimen of 1595, though relying chiefly on Giustiniani's Psalter, also contains material from the Medicean Gospels; and his second of 1599 contains material from the Euclid.³¹ He did not make use of the abridged version of Idrisi's *Nuzhat al-mushtāq* at this stage and in any case no European version yet existed. By 1606, however, he had acquired a copy and his knowledge of Arabic had advanced sufficiently for him to draw up a glossary which he completed the following year.³² Valentin Schindler may have used the Medicean publications for some of the Arabic vocabulary in his *Lexicon Pentaglotton*, which first appeared in 1611 and represents the first printed polyglot dictionary of oriental languages to include Arabic;³³ and Franciscus Raphelengius certainly made use of the Gospels, grammars, Geography and *Canon* (though not the Euclid) in his *Lexicon Arabicum* published posthumously by his sons in 1613 as the first printed Arabic-Latin dictionary.³⁴ Turning back to England in the mid-seventeenth century, though Edmund Castell was mainly indebted to Antonio Giggei's *Thesaurus Linguae*

Arabicae (and thence to the new ground of the eastern lexicographers) for the Arabic element in his *Lexicon Heptaglotton*, the examples he gives from the Arabic *Canon* may also derive from the Medicean edition.

In addition to providing raw lexicographical material for pioneering Arabists at the turn of the century and beyond, the Medicean publications deserve recognition for a more profound textual contribution to the European revival of Arabic studies. New critical editions and translations of their Arabic texts by scholars throughout the seventeenth century were either based directly on them or stimulated by their example.

Given the lack of grammar books available to European students of Arabic, it is not surprising that the Medicean edition of the *Ājurrūmiyya* was of great interest to Arabists. Many attempts were made to reedit or translate it and some of these were successfully published. Jacob Christmann owned interleaved copies of both the *Ājurrūmiyya* and the *Kāfiya*;³⁵ and some cross references he made to the longer work indicate his interest in extending his knowledge of the shorter work. Moreover, his vocalising of the *Ājurrūmiyya* and his other annotations indicate that he made a rough comparison of the edition with a manuscript copy from the Maghrib.³⁶ Copies of the Medicean grammar books were also acquired in 1602 by the English Brownist Matthew Slade, rector of the Latin school in Amsterdam and manager of the city library.³⁷ A very few glosses as well as the inclusion of pagination and line numbers show how Slade's copies were also consulted by Jan Theunisz. Isaac Casaubon made some notes in his copy of the *Ājurrūmiyya*.³⁸ In October 1613, one of Frans Raphelengius' two younger sons, Joost, made a copy of the Medicean edition of the *Ājurrūmiyya* apparently in order to republish it with a Latin version which his father had made years before.³⁹ Copying the text took a couple of days on 9 and 10 October 1613; and although one or two obvious misprints were corrected, there is no evidence of a critical approach to the text, even though the vocalisation was to have been included. It was also intended that the Elder Raphelengius' Latin version would be supplied interlinearly.

A French student of Arabic, Jean-Baptiste Duval, travelled to Rome in 1608 and then to Venice where he collaborated with a Syrian on a translation of the Medicean *Ājurrūmiyya* and *Kāfiya*, first to Italian and thence to Latin.⁴⁰ At Paris in 1612 Jacques-Auguste de Thou, having seen the Medicean *Ājurrūmiyya*, asked the Maronite scholars Gabriel Sionita and Victor Scialac to translate it for him. Savary de Brèves, their patron, wrote to de Thou on 25 June 1612 saying, with his usual candor, that he did not think this would help him to learn the language, 'car à vous dire le vrai tout ce qui est fait à Rome n'est pas grande chose'. Nonetheless he was able to say that the Maronites

were working on the translation and that he would have it printed.⁴¹ This they never achieved, though one man who got his translation of the *Ājurrūmiyya* into print with a revised edition of the text was Peter Kirsten. His three-part grammar of Arabic, published with his own type at Breslau in 1608 (Book 1) and 1610 (Books 2 and 3), is highly derivative of other European publications and of the Medicean publications in particular.⁴² In his first book on the alphabet Kirsten relied heavily on the *Alphabetum Arabicum*, and often quotes from it *verbatim*. The third book contains Kirsten's reedition and translation of the *Ājurrūmiyya*. In his notes he shows precisely where he has added or substituted passages from his own manuscript copy of the text in order to improve upon the Medicean edition; but he admitted that the manuscript he was working from was a poor copy and hoped, therefore, that someone else with access to better copies might be able to improve upon his work. That man was Thomas Erpenius. At Paris in 1611, he compared the Medicean edition with a manuscript copy, which, like the one Christmann used, was of *maghribī* provenance;⁴³ and in 1617, he published his own edition and translation of the *Ājurrūmiyya* on the basis of four manuscript copies.⁴⁴ Then at Rome in 1631 another edition and translation of the *Ājurrūmiyya* was published by Tomaso Obicini.⁴⁵ Neither Erpenius nor Obicini made use of the *Editio Princeps* for their reeditions, though in the competitive atmosphere of Arabic studies in those days it should certainly be accorded the role of a catalyst.

Like the *Ājurrūmiyya*, the Medicean edition of the *Nuzhat al-mushtāq* was of great interest to European scholars, even though no mediaeval Latin version existed. The Italian polygraph Bernardino Baldi used that edition to make an Italian version in 1600, which was never published;⁴⁶ and in 1606, as we have seen, William Bedwell gave careful consideration to the Arabic text. Erpenius too studied the Arabic edition and intended to publish a translation;⁴⁷ but it was at Paris in 1619 that a Latin translation of the *Nuzhat al-mushtāq* was finally published.⁴⁸ This had been prepared by the Maronite scholars Gabriel Sionita and Johannis Hesronita, once again on the basis of the *Editio Princeps*; and in its Latin guise Idrīsī's text—which, due to a copyist's mistake or a misprint in the Arabic edition, the translators attributed to a Nubian author—provided the European public with a completely new source of information on the topography and toponymy of the Islamic World.

Returning to the Medicean edition of the *Canon*, which as we have seen was read by several scholars in conjunction with Gerard of Cremona's Latin version, four seventeenth-century Arabists should be singled out for their publication of reeditions and new translations of parts of the Arabic *Canon*, and for their reliance on the Medicean edition in particular. Peter Kirsten, whose use of the *Ājurrūmiyya* and the *Alphabetum Arabicum* has already

been noted, also turned to the Medicean Arabic *Canon* for his own reedition of Book 2 on Simple Drugs, which he corrected with the help of some manuscript sources and to which he added his own new translation.⁴⁹ Later in the century, in 1658, Vopiscus Fortunatus Plemp, professor of Medicine at Louvain, used the Medicean edition with some manuscripts in order to produce his own edition and translation of Books 1 and 2 and Book 4.1. That same year, Pierre Vattier, physician to the Duke of Orleans, produced a vernacular version from the Arabic of Ibn Sinā's *Najāt* entitled *La Logique du Fils de Sina communément appelé Avicenne*. Although he does not state so himself, it is probable that Vattier made his translation on the basis of the Medicean edition. Such at any rate is the suggestion in the Royal Privilege that appears in the work which also refers to his Latin version of the Arabic *Canon* of which Book 3.1 appeared in the following year, 1659. And at Augsburg in 1674, Georg Welsch, a practicing physician, published his edition and translation of two chapters of Book 4.3, again on the basis of the *Editio Princeps*.⁵⁰

In England, too, the Medicean publications and their derivative versions contributed towards the development of Arabic studies. As we have seen, William Bedwell was indebted to some of those Arabic editions as a primary source at the onset of the century; and later on there are references to those books in other works by English scholars. Even though they had recourse to a far greater range of Arabic sources than Bedwell had, Edward Pococke, John Greaves, Edmund Castell and Brian Walton all made some limited use of those famous editions from Rome; and it may be that further research into their unpublished writings will reveal a more profound interest in those books. One specific and important exploitation by an English scholar of a Medicean publication was when the Savilian Professor of Mathematics at Oxford, John Wallis, published a Latin version of the section on the fifth postulate from the Medicean Arabic edition of the *Elements*. The translation has been attributed to his colleague, the professor of oriental languages, Edward Pococke; and it was by this means that the Arabic *Elements* continued to exercise an influence on European mathematics throughout the eighteenth-century.⁵¹

II

Raphelengius had assumed that the Arabic publications of the Medici Press must have been the product of a commercial enterprise directed exclusively towards the Arab World.⁵² If this was the case—and as we shall see *Raphelengius*' claim was not unreasonable—we would have to conclude that the impact of those books on European scholarship and printing had been

entirely fortuitous. But there is clear evidence to support the contrary notion that members of the press also sought to serve European academic ends. In unravelling the priorities of its staff and its founder, we are fortunate in having a wealth of material at our disposal, including official statements of purpose, the publications themselves, records relating to the distribution of those publications and to the changing fortunes of those involved, and the oriental manuscripts they collected and worked on.

In the context of late sixteenth-century Rome, it is not surprising that public statements aimed at gaining political or financial support for the press should imply a strong missionary bias. The legal document by which Cardinal Ferdinando de' Medici founded the press on 6 March 1584 mentions his weighing of the pecuniary and scientific advantages of his investment, but stresses above all the universal benefit to Christendom it would bring.⁵³ His subordination of academic interest to missionary goals was repeated on another occasion which was recorded by the director of the press, Giovan Battista Raimondi:

He ordered first the printing of the Holy Bible in Arabic in its entirety, or piecemeal at this early stage, and all Catholic books on Scripture that could be recovered in that language in order to serve the Arab Christians in the East and the Granadans in Spain. And he ordered the printing of all available Arabic books on permissible human sciences which had no religious content in order to introduce the art of printing to the Mahomedan community so that by the same means knowledge of the Mahomedans' errors and of the truth of the Christian faith could gradually get through to them.⁵⁴

Obviously it was expedient for Raimondi to repeat this kind of missionary ambition when seeking papal support for the project or hoping to attract customers for the books. In an attempt to effect the sale of thousands of copies of the Arabic Gospels to King Philip III of Spain, Raimondi recalled Pope Gregory XIII's optimistic belief that the mere reading of the Gospels in Arabic would be sufficient to convert the infidels.⁵⁵

As for the Arabic publications themselves, several features explain Raphelengius' assumption that the press was intent on fostering an eastern market. First, none of the books contain the prefaces and introductions usually to be found in European books.⁵⁶ Next, certain issues of the secular texts contain no indication of a western provenance whatsoever. Furthermore, the book design of eastern manuscript copyists has been carefully imitated through rubricating titles or headings, placing the text within a rule, or ending with the inverted pyramid of the colophon. Additional proof for their eastern destination is offered in a page of Ottoman Turkish, appended to the Arabic text of the Euclid. It is a *firmān* issued by Sultan Murad III at Istanbul early in the month of *dhū 'l-hijja* AH 996 (October/November AD

1588), and orders Ottoman officials not to confiscate goods carried by European merchants as had happened to Beranton (Birāntūn) and Orazio Bandini who were carrying printed material in Arabic, Persian, and Turkish. It is clearly stated that such 'Frankish' merchants must be allowed to trade, unmolested, in goods as well as in books.⁵⁷

Other features suggest that the books were a hybrid product intended for consumption in the west as well as the east. Some of the secular texts make a gesture in the direction of a western readership through additional Latin title pages, or Latin titles and imprints overprinted on the Arabic title pages.⁵⁸ The two Christian texts—the Gospels and the Confession of Faith—appeared in separate editions with Latin versions and could have served as didactic tools for incipient Arabists, though the unvocalised Arabic would not lend itself ideally to this. Alternatively the bilingual edition of the Gospels could have been used for teaching the text of the Vulgate to Arabic speakers. An Arabic note appended by the censors to Ibn Sīnā's *Kitāb al-Najāt* is an important indication that a European—or at least a Christian—readership was expected.

Although many issues have been raised in this treatise on metaphysics by Avicenna that are contrary to our Catholic faith and which in some cases even resemble it, nevertheless it does not impart it or present Christian teaching in the way our religion teaches it. We have therefore indicated some of them with this sign * in the margin and we have granted permission for it to be published in print on account of the other useful matters which it contains and in order that linguists may be given the opportunity to learn the Arabic language as well.⁵⁹

Clearly, the *Alphabetum Arabicum* is exceptional among the Medicean publications in providing precisely for a European need. But since it only teaches the beginner how to read a vocalised text out loud, it does not contain sufficient information to enable him to read, let alone understand, the other unvocalised publications. Frustratingly for the isolated autodidact, this information is contained in the two elementary grammatical tracts on *nahw* (inflection and syntax); but without a teacher the key to their contents must remain locked within their unvocalised lines. In Rome, among the Neophytes and Maronites, there were teachers whose mother tongue was Arabic; and it may have been in their colleges that these grammatical tracts were employed.

The records of the press reveal a deliberate attempt to distribute the publications in both East and West. Among Ferdinando's orders, Raimondi recorded one which requested Florentine merchants to investigate the readiness of Muslims to receive printed books.⁶⁰ And for over thirty years the market for printed books in the Islamic World was primed and investigated with proof sheets and presentation copies. In June 1587, the first two pages of Idrisi's geography were sent to North Africa, Istanbul, and Cairo.⁶¹ In April 1595, a Maronite priest leaving for the Levant was given the Avicenna, Euclid



3. The *firmān* Sultan Murad III issued at Istanbul in AH 996 (AD 1587), concerning European merchants and their carrying of printed matter in Arabic script through Ottoman territories. Published at Rome in 1594 by the Medici Oriental Press on the verso of the the final page of the Arabic edition of Euclid's *Elements*.

and Idrisi, as well as a copy of the Gospels to give to his Patriarch.⁶² In July that same year eleven copies of the Gospels were bought for the Patriarch of Alexandria.⁶³ In May 1596 a member of the Neophyte college who was leaving for Jerusalem was given a copy of the Gospels.⁶⁴ In November 1598 sections of the Avicenna and of the Euclid and a complete copy of each of the other secular books were sent to Sicily *en route* for North Africa.⁶⁵ And a decade later, in June 1610, a Carmelite friar was given a large consignment of books to take to Persia.⁶⁶

There are also records of sales to local people in Rome. But in the autumn of 1594, agents of the press were sent to the Frankfurt Fair, which offered an established outlet for booksales in the North. There, two English merchants believing they could interest Levantine and North African merchants in London in the Medicean publications from Rome, exchanged maps and cloth for the full range of books.⁶⁷ In June 1595, Paul Maupin, a craftsman who worked for the press, bought several of the books to take to France.⁶⁸ And in March 1600, a priest who was leaving Rome for Spain was given three copies of the Gospels and the *Alphabetum Arabicum* to take with him.⁶⁹

In spite of these efforts, the Medicean publications did not sell in anything like the numbers to justify the size of the print runs. They were even used as barter in payment of services rendered to the press. In 1619 and 1774 the Gospels were reissued with new title-pages;⁷⁰ and records from the late seventeenth-century show that a considerable proportion of all the books still remained unsold.⁷¹ How could the management of the press have misjudged the markets of their own day so extravagantly?

Their challenge to the Arabic manuscript copyists was clever and courageous. Other products of European technology such as paper and clocks and watches had been successfully exported to the Ottoman world and it seemed there would be a market for printed books too. But while, with Raphelengius, we may admire their audacity in speculating with an unknown eastern market, their assumption that somehow western needs could be provided for with the same product seems commercially reckless.

Giovan Battista Raimondi (c.1536-1614), who directed both the editorial and practical aspects of the press, was a man of unusual abilities and sustained commitment, especially to the scholarly ideals of its foundation. For over thirty years until his death, he collected manuscripts and worked fervently to prepare texts—especially grammar books and dictionaries of oriental languages—for publication. The fact that his extremely ambitious publishing programme was only partially and seemingly carelessly put into effect was the result not of his own ineptitude, but rather of a series of misfortunes over which he had no control.

In April 1585, within little over a year of its foundation, the press had lost its most influential guardian, Pope Gregory XIII. Two years later in 1587 Cardinal Ferdinando de' Medici, whose initial investment appeared to have set the press on a firm basis, moved to Florence to succeed his brother Francesco as Grand Duke of Tuscany. That same year the death of Ignazio Na'amallah (also known as Nehemes), the refugee Jacobite Patriarch of Antioch, was a major blow to the publishing team. It was under the Patriarch's chairmanship that a committee was to have produced not only the edition but also a new translation of Ibn Sīnā's medical *Canon*. Some recompense for his loss was in his manuscript collection which passed into the possession of the press. But then in 1589 Robert Granjon, the outstanding French type cutter, died. All this before a single book had been issued!

In these circumstances it is hardly surprising that Raimondi had little opportunity to pursue a publishing programme that would make sense to a European readership. The best he could hope for was that the West would in some way be served by books designed for the East. As we have seen, this was the case though there could never be great demand for such inaccessible texts. Nor were the chances of the press's commercial success in the West improved when the unscrupulous foreman of the press, Matteo Nerone, took advantage of his position to pirate extra copies of the books. He sold these and others which he stole in 1593 at reduced prices and, as a result, Raimondi's agents in Frankfurt a year later found it impossible to sell for retail prices.⁷²

At this stage it might have been possible to make commercial sense of the books through further investment in complementary translations and didactic tools of the sort expected by Christmann and Raphelengius. In an attempt to elicit such support, Raimondi referred to the praises and expectations of both northerners.

The generosity and magnificence of the House of Medici is to be seen shining more clearly [in the Avicenna and the Euclid] than in the introduction of the Greek language and books into Italy. This is what I have read in many contemporary publications including in particular a book by Jacob Christmann published at Frankfurt and in an introduction to the Arabic language*Si.e.* the Alphabet by Raphelengius published at Antwerp [*sic*]—and many others. They cannot praise and extol the venture enough, blessing the original author and thanking him for what has been done and hoping for more in the future.⁷³

But Ferdinando had decided to cut his losses; and in 1596 a contract was drawn up selling the press to Raimondi. For a further fourteen years the terms of the sale made it possible for Raimondi to publish; only in 1610, thanks to Ferdinando's successor at Florence, Cosimo III, was the burden lifted and Raimondi published his edition with his two Latin translations of 'Izz al-Din

al-Zanjānī's *Kitāb al-Taṣrīf*.⁷⁴ In northern Europe rumours of the impending publication of an Arabic grammar at Rome had startled Thomas Erpenius, who was hoping to conquer the continent with his own grammar book.⁷⁵ And although it was the Dutchman's work that was to stand the test of time, Raimondi's *Liber Tasriphi* was a beautifully researched and produced book which demonstrates how even in the last years of his life, proper patronage enabled him to serve the European Republic of Letters with a suitable publication.⁷⁶

NOTES

¹ Source material for the history of the Medici Oriental Press is now mainly located in three libraries at Florence: the Biblioteca Nazionale, the Archivio di Stato, and the Biblioteca Mediceo-Laurenziana.

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For basic information on Arab authors the new edition of the *Encyclopaedia of Islam* (Leiden 1960s) is cited. (Hereafter referred to as *EI*.)

² Schnurrer 318 (I); Korolevskij 29.

³ Schnurrer 318 (I); Korolevskij 29.

⁴ Schnurrer 42; Korolevskij 31. On the author, Ibn al-Ḥāḡib, see *EI*, III, p.781. R. Smitskamp in *Philologia Orientalis*, I (Leiden, 1976), p.37, 30b follows De Gubernatis (p. 204) in claiming that Raimondi prepared a Latin version of the *Kāfiya* which remained unpublished. There is, however, no documentary evidence to support this.

⁵ Schnurrer 43; Korolevskij 32. On the author, al-Ṣanhāji, known as Ibn Ājurrūm, see *EI*, III, p. 697.

⁶ Schnurrer 187; Korolevskij 33. On the author, Idrīsī, and this version of his text see *EI*, III, pp.1032-1035.

⁷ Schnurrer 393; Korolevskij 34. On the author, Ibn Sinā, see *EI*, III, pp. 941-947.

⁸ Schnurrer 401; Korolevskij 35. On the variety of ways in which this edition of the *Elements* was issued, see Cassinet.

⁹ Schnurrer 239. Korolevskij 36.

¹⁰ Published at Rome in 1566 by the Jesuit College. Schnurrer 237; Korolevskij 21.

¹¹ Schnurrer 41; Korolevskij 30.

¹² Schnurrer, p. 240; Korolevskij 37; J. Nasrallah, *L'Impimerie au Liban* (Beirut

1949), p.xix; Vervliet, p. 201.

¹³ Prior to the Medicean Arabic publications, only seven books contain passages, or their entire texts, in Arabic, printed by means of moveable metal type. For each book a different font was used. They are in order of appearance:

1. 1514: *The Fano Book of Hours*. Schnurrer 235.
2. 1516: Agostino Giustiniani's polyglot Psalter from Genoa.
3. 1537/8: The Venetian Qur'ān printed by Alessandro and Paginino Paganini.
4. c.1540: Postel's *Grammatica Arabica* from Paris. Schnurrer 38.
5. 1566: Eliano's Confession of Faith from the Jesuit College at Rome. Schnurrer 237.
6. c.1570-80; *Muṣāḥabat ruḥāniyya* (The Spiritual Colloquy). Schnurrer 236.
7. 1585: Domenico Basa's edition at Rome of *Kitāb al-bustān fī 'ajā'ib al-arḍ wa 'l-buldān*. Schnurrer 189.

At least another seven books in this period contain passages in Arabic or Arabic words which are either hand-written or printed from wood-cut.

¹⁴ *Arte para legeramente saber la lingua araviga* (Granada, 1505). Schnurrer 37.

¹⁵ For Postel's grammar and its derivatives, see Jones, *Thesis* (1988), section 3.4 and subsequent sections.

¹⁶ Jacob Christmann, *Muhamedis Alfragani Arabis Chronologica* (Frankfurt 1590), p. 521:

'Hoc anno Christi 1589 [sic] a Pontifice Sixto V [sic] institutum est praelum Arabicum: ex quo prodierunt Avicenna, Euclides, et quatuor Evangelistae: qui libri pulcherrimo caractere sunt impressi, ut ductus et connexiones literarum Arabicarum optime manuscriptis respondeant. Si typus aliquis accesserit, qui puncta vocalia recipiat, et quo Grammaticae institutiones, Lexicique Arabici expositiones excudi possint: non dubium est, quin brevi temporis spacio tota Europa linguam Arabicam sit excultura.'

¹⁷ Franciscus Raphelengius, *Specimen Characterum Arabicorum* (Leiden 1595), pp. 2-3:

'Nam cum abhinc multis annis huius linguae studium amplexus, nihil viderem exstare quod lectores ad id incitaret aegre ferebam neminem facultatibus pollentem hanc rem promovere. Extiterunt quidem qui aliquid tentarunt, fuissentque haud dubie progressi si sumptibus forte non deteruissent. Verum dum tot annos in ea expectatione essem, tandem venit in mentem quibusdam principibus viris ut Romae typographiam instituerunt, elegantissimis typis refertam: ad quam quidem exornandam nullis eos sumptibus pepercisse facile apparet ex iis quia in lucem inde prodierunt. In his itaque conatibus, quorum fama indies increbrescebat cum animus conquiesceret, cum spe fore ut ex instructissima officina prodirent quae explerent desiderium studiosorum; ecce evulgantur opera Arabice exusa, insignia quidem ac magni momenti, cum tanta elegantia ut ad maiorem ornatum nihil addi posse audeam affirmare: set quae sitim Europaeis nostris adhuc rudibus non explere plerique conquererentur. Nam quoniam colligere licet eos nihil aliud spectasse quam ut Arabibus, praesertim Christianis, suis laboribus inservirent, maximum quaestum ex libris quos excuderent, percipiendi spe adductos; eorum institutum etsi laudabile sit, magnis probaretur si nostrorum hominum utilitati [p.3] etiam consulissent, edendo videlicet Institutiones Grammaticas inductis convenientes, et lexicon, qua a principio promiserunt. Quae certe ratio me movit, ut ad illorum imitationem curarem sculpi characteres, eo fine ut Occidentales eodem beneficio quo videbam ab Italis Orientales esse affectos, aliquando fruerentur.'

¹⁸ William Bedwell's dedicatory Epistle to James I, c.1604, (Bodleian Library Oxford, MS.Laud Or.58, fol. 7r-v), edited by Alastair Hamilton in *William Bedwell the Arabist* (Leiden, 1985), p. 111:

'Soli illi Cardinalis Medicaei sumptibus adiuti, aliquid laude dignum et omni expectatione longe maius effecerunt: at non studiosorum et commune commodum illis

propositum, sed proprium et privatum. Dictionarium Arabicum multi promiserunt, plures tentarunt, omnes expectarunt, sed adhuc exolvit nemo.'

Bedwell's almost literal repetition of this passage in his *Epistle to Lancelot Andrewes*, c.1606, (British Library, London, MS.Slo.1796, fol.21r-v), is also edited by Hamilton, *op.cit.*, p. 117.

¹⁹ De Brèves' correspondence quoted by Gérard Duverdier in *Le Livre et le Liban*, p. 239: '... mais encore si mal [imprimé] et si éloigné du sens de l'arabesque, qu'à vous dire le vrai tout ce qu'ils ont fait est faux.'

²⁰ For Erpenius on Jan Theunisz., see Isaac Casaubon, *Epistolae*, (Rotterdam, 1709), p. 666; the text of this letter to Casaubon is repeated in Schnurrer, p. 355.

²¹ Thomas Erpenius. *Grammatica Arabica dicta Gjarumia*...Leiden 1617, sig.A2^v: 'Excusus aliquando hic libellus Romae fuit in Typographia Medicae elegantissimo charactere, set admodum mendose omissis passim et corruptis non vocibus tantum sed et integris sentiis...'

²² See the articles by Vervliet and Tinto, and also Tinto's monograph (1987).

²³ For this sensational discovery, see: Angela Nuovo. 'Il Corano arabo ritrovato (Venezia, P. e A. Paganini tra l'agosto 1537 e l'agosto 1538)' in *La Bibliofilia*, LXXXIX/iii (1987), pp. 237-271.

²⁴ See Jones, *Dissertation* (1981), pp. 69-70.

²⁵ *Le Livre et le Liban*, pp. 238-9, note by Gérard Duverdier on exhibit 121, Giustiniano's polyglot Psalter.

²⁶ For editions of the *Canon*, see Nancy Siraisi, *Avicenna in Italy* (Princeton 1987), and Rafaela Gonzáles Castrillo, *Rhazes y Avicenna en la Biblioteca de la Facultad de Medicina de la Universidad Complutense. Descripción de su obra medica impresa y comentarios* (Madrid 1984).

For editions of the *Elements*, see: Max Steck, *Bibliographia Euclidean* (Hildesheim, 1981), (*Arbor Scientiarum, Beiträge zur Wissenschaftsgeschichte*, Reithe C. Bibliographien, Band I).

²⁷ *BNF*, II, III, 15. For further information, see Jones, *Dissertation* (1981), appendix VI.

²⁸ Leiden University Library, 878A.4.: Scaliger's copy of the Medicean Arabic *Canon*.

²⁹ Paris, Bibliothèque Nationale, Rés.T29.5: Etienne Hubert's copy of the Medicean Arabic *Canon*.

³⁰ British Library, London, 542.h.4.

³¹ Hamilton, *op.cit.*, p. 12.

³² *Ibid.*, pp. 26, 87.

³³ Valentin Schindler, *Lexicon Pentaglotton* (Frankfurt, 1611). Issued a second time that same year at Hanau. Second edition Frankfurt, 1653.

³⁴ On Raphelengius's lexicon, see Alastair Hamilton, "'Nam Tirones sumus"—Franciscus Raphelengius' *Lexicon Arabico-Latinum* (Leiden 1613)' in *De Gulden Passer* (1989).

³⁵ Groningen, University Library, *alpha*. fol. 17.

³⁶ Groningen, University Library, MS 461. Copy dated AH 918 (AD 1512/3).

³⁷ Amsterdam University Library, 301.D.23.

³⁸ British Library, London, 14593.b.31.

³⁹ Leiden, University Library, Cod.Or.3041 (Ar.2401).

⁴⁰ *Le Livre et le Liban*, p. 204, entry for exhibit 75: Duval's manuscript copy of his Arabic lexicon, of which the preface is discussed here by Gérard Duverdier.

⁴¹ *Ibid.*, p. 202, entry for exhibit 71: the Medicean *Ājurrūmiyya*, discussed by Gérard Duverdier with reference to the translation by the Maronites.

⁴² Schnurrer 45.

⁴³ Bibliothèque Nationale, Paris, MS.Ar.4127.

⁴⁴ Schnurrer 53.

⁴⁵ *Ibid.*, 63.

⁴⁶ *El* article (see note 6 above).

⁴⁷ British Library, London, MS Burney 364, fol.27r, an unpublished letter from Thomas Erpenius to Isaac Casaubon dated Leiden, 28 May 1614, containing the following:

'Studia mea quod attinet, multa in manibus habeo, sed prae ceteris ad editionem paro versionem latinam duplicis Geographiae Arabicae, Abilfedae [i.e. Abu'l-Fidā's *Taqwīm al-buldān*] inquam, et illius Nubiensis [i.e. Idrisi.].'

⁴⁸ Cf. Schnurrer, p. 168: *Geographia Nubiensis*.

⁴⁹ Schnurrer 394.

⁵⁰ On these editions of Avicenna, see Siraisi, *op.cit.*, pp. 127-128, 153-156.

⁵¹ See Cassinet, *op.cit.*

I am grateful to Raymond Mercier for keeping me informed of his research on Wallis. See his chapter in this volume.

⁵² See above, note 17.

⁵³ ASF, *Stamperia Orientale*, Filza 3, doc.1: 'Instrumento di fondazione della Congregazione per la Stamperia Orientale' 1 [sic] Marzo 1584.

Essendoci stato proposto da m. Giovambattista Raimondo una impresa di stampa in lingua Arabica et Caldaica trattata da esso con Mons. or Patriarca d'Antiochia, recercando favore et commodità di poter mettere in Atto, et havendo considerato non tanto l'util pecuniario che se ne potesse conseguire et la facilita che si accresce alla notitia delle scientie, quanto al poter con tale occasione aprirsi la strada all'avumento della fede.'

Edited by Biagiarelli (1971), p. 88, documento 1.

The date of this inaugural document is a little difficult to read; and though 1 March is a possible reading (and has been given in the index to the file), both Saltini (1860), p. 261, and Tinto (1987), p. 6, prefer to date the inauguration of the press to 6 March 1584.

In a later document (Filza 3, doc.17), Raimondi actually refers to the inaugural document as being dated the sixth of March.

⁵⁴ ASF, *Stamperia Orientale*, Filza 3, Doc. 20:

'Breve raguaglio delle cose fatte dal'ill. sig. cardinale de' Medici, intorno la protentione datali del Patriarca d'Antiochia, del Patriarca d'Alessandria, e del re d'Etiopia dalla felice memoria di Gregorio XIII.' (i.e. a report written by Raimondi sometime between the death of Gregory XIII and Ferdinando's becoming Grand Duke of Tuscany, and possibly therefore for the benefit of Pope Sixtus V.)

'Comando che in lingua Arabica si stampasse principalmente la Biblia Sacra insieme o vero in questi principii a parte a parte et tutti libri cattolici della scrittura che si potessero ritrovare in detta lingua et questo per servitio de christiani Arabi quali sono in oriente et Granadini in Spagna. Et che si stampassero tutti li libri che si potessero havere in lingua Arabica di scientie humane licite nell quali non si trattasse niente di religione. Et questo per indocure la stampa fra Mahumettani acciò con questo mezzo pian piano vi possi penetrare la notitia dell'errori di Mahumettani et la verita della fede Christiana.'

⁵⁵ ASF, *Stamperia Orientale*, Filza 3, doc. 30.

⁵⁶ Both the monolingual and bilingual editions of the Gospels the text begins on p.[9] leaving room for 4 leaves of preface to be added at a later stage.

⁵⁷ This printed *firmān* is illustrated in *Le Livre et le Liban*, p. 248.

⁵⁸ See especially the two grammatical tracts and the Geography, all published in 1592.

⁵⁹ For the original Italian version of the stricture printed in Arabic at the end of the *Najāt*, see BNF, MS II.V.157, fol. 15':

'Non ostante che in questo trattato de Metafisica d'Avicenna vi siano molte cose contra la nostra fede Cattolica et alcune che si bene pare se aprosiman non dimeno non

avribanno ne propungono la verita con quel modo che la nostra fede delle quale alcune n'havemo notate nel immargine del libro con questo signo* per l'altre cosu utile che vi sono et per dar commodita alli studiosi delle lingue d'impura ancora questa lingua Arabica, havemo permesso che si publichi nelle stampe.'

⁶⁰ ASF, *Stamperia Orientale*, Filza 3, doc. 20:

'Breve raguaglio...'

'Ha mandato per tutte le parte di Mahumettani dove prattica et ha commertio la natione ferentina ad esplorare la volonta di detti Mahumettani intorno al ricevere detti libri stampati...'

⁶¹ ASF, *Stamperia Orientale*, Filza 2, doc. iv:

'Esito delli libri stampati del libro di Geografia in Arabico.

A 19 di Giugno del primo foglio et del secundo dati al signor Cipriano per mandare in Africa et in Constantinopoli...no.1 di ciascuno.

A 26 di Giugno 87 del primo et secundo foglio dati al signor Cipriano per mandare in Cairo...no.1.'

⁶² ASF, *Stamperia Orientale*, Filza 2, doc. XXV, fol. 6v:

'A 4 d'Aprile 1595 martedi partirono di Roma per Levante il Padre Moise et suo compagno Joseph, Marroniti, al quale Padre Moise fu dato un Avicenna Arabico, un Euclide Arabico scolti et un libro di Geografia ligato con fittucie di seta per mostra con una instruttione di quello che haveva da fare per la smatitione di detti libri [et tutto questo con saputa del illustrissimo signor Imbasciatore] et ancora un libro delli Evangelii per portar lo in dono al loro Patriarcha.'

⁶³ ASF, *Stamperia Orientale*, Filza 1, doc. 26: a copy by G.B. Raimondi of a document written by Giovan Battista Bandini on 3 July 1595 stating that he had paid Raimondi 53 1/2 Scudi for 11 copies of the bilingual Gospels that were to be given to the Patriarch of Alexandria.

⁶⁴ ASF, *Stamperia Orientale*, Filza 2, XXV, fol. 9r: 'A 29 di Maggio 1596 donai un volume delli Evangelii Arabi Latini a Ms Giorgio del Collegio di Neofiti qual voleva partire per Jerusalem.'

⁶⁵ *Ibid.*, fol. 13r:

'A 21 di Novembre 1598 sabbati si mandorono le mostre delli libri Arabi in Sicilia, per Africa. Cioe molti quinterni del 30 libro delli Canon di Medicina d'Avicenna. Alcuni quinterni del primo libro di Euclide. Una geografia interia, una Grammatica Cafia, et una Grammatica Giarromia.'

⁶⁶ *Ibid.*, fol. 32r:

'A 8 di Giugno 1610 ho donato al P. fra Vincenzo descaldi per portar in Persia de libri Arabi—un Avicenna; 4 Evangelii Arabi; 2 Evangelii Arabi Latini; 4 Geografie; 6 Grammatiche Giarromie; 20 professioni della fede.'

⁶⁷ Biagiarelli, (1979), p. 130.

⁶⁸ ASF, *Stamperia Orientale*, Filza 2, XXV fol. 7r:

'A primo di Giugno 1595 parti di Roma Ms Paulo Maupino per Francia et hebbe 4 giorni primi 10 Evangelii Arabi Latini, un corpo d'Avicenna, dui volume d'Euclide, una Geografia, et 20 Alfabeti Arabi Latini da pagarsi al prezzo ordinario.'

⁶⁹ *Ibid.*, fol. 17r:

'A 28 di Marzo 1600 parti di Roma il P. fra Thomaso de Marchis per Spagna, et porto 3 Evangelii Arabi Latini scolti, una Grammatica Caldaica Latina sciolta, un' Alphabeto Arabico sciolto, et li porto per mostra.'

⁷⁰ Reissued at Rome in 1619 by Jo. Antonius Rodolus, with a dedication to Cardinal Madrutius; and again at Florence in 1774, by Caesar Malanimeus, historian of the Biblioteca Mediceo-Laurenziana.

⁷¹ Bandini, p. 33; repeated by Saltini (1860), p. 293, note 2:

	<u>Unsold</u>	<u>Original Print Runs</u>
Gospels (bilingual)	1039	3500
Gospels (Arabic)	566	1500
Avicenna	810	1750
Euclid	1967	3000
Idrisi	1129	1600
Arabic Grammars	280	1300 (of each)
Alphabeticum Arabicum	0	1500
Apollonius of Perga (Latin)	427	
Syriac Missal (1594)	1	

(For the original print runs, see Bertollotti, p. 237.)

⁷² Bertollotti, *passim*, using a number of sources in the Vatican library.

⁷³ ASF, *Stamperia Orientale*, Filza 3, doc. 27:

'Vi si vede, dove chiaramente riluce la liberalità et la magnificentia della Casa di Medici più che nella introduzione della lingua et delli libri Greci in Italia, cossi come ho letto in molti libri hora stampati et in particolare in un libro di Jacomo Christman, stampato in Frankfurt, et in una introduzione della lingua Arabica, cioè in uno Alfabeto del Rafalengio stampato in Anversa [sic], et in molti altri, dove non restano satii mai di lodare et magnificare questa impresa benedicendo l'autore principale, et ringratandolo delle cose fatte con sperare dell'altre future...'

⁷⁴ Schnurrer 47.

⁷⁵ British Library, London, MS Burney 364, fol. 23r-v. A letter from Erpenius to Casaubon, dated Saumur xiii Kalends September 1610.

⁷⁶ ASF, *Stamperia Orientale*, Filza, doc. 38:

'Sommario del Negozio da proparsi al Serenissimo Gran Duca di Toscana', though not in Raimondi's hand, may yet testify to a desire, towards the end of his life and following on the success of the *Liber Tasriphi*, to serve a European readership alone. The document proposes the commercial basis for establishing a press producing books of Arabic interest for Europeans. Precise costs and forecasts of sales are given. The mention of Savary de Brèves and an Arabic font that was made for him would date this document after 1611 (cf. *Le Livre et le Liban*, p.160); and therefore this proposal would have been made to Ferdinando's successor, Cosimo III.

Three different Arabic fonts would be made at a cost of 1000 Scudi. The following books would then be published:

<u>Book</u>	<u>Cost</u>	<u>Return on 2000 Copies</u>
Latin Arabic Grammar	400	4,000
Arabic/Latin <i>Qāmus</i>	1,000	20,000
Arabic Bible in Latin	1,000	16,000
Arabic Science in Latin	600	6,000
Latin Qur'an	1,000	20,000

MORDECHAI FEINGOLD

PATRONS AND PROFESSORS:
THE ORIGINS AND MOTIVES FOR THE ENDOWMENT OF
UNIVERSITY CHAIRS—IN PARTICULAR THE LAUDIAN
PROFESSORSHIP OF ARABIC

In the three decades before the English Civil War, the infrastructure at Oxford underwent profound changes. Endowed professorships increased from five to ten; three new lectureships were established; plans for two new colleges came to fruit; the Botanical Garden as well as the Bodleian Library were constructed; and a new set of university statutes were drawn up. To this list may be added plans for two additional chairs which, however, failed to materialize. This unprecedented augmentation of both teaching and research opportunities at Oxford was matched by an expanding matriculation, which would be surpassed only in the nineteenth century.

Although historians have noted this momentous period of university expansion, occasionally singling out for discussion one or another of the individual foundations, no attempt has been made to take an overview of what may be termed the 'collective act of benefaction' that so transformed Oxford. Nor has there been any sustained effort to explore either the motives that may have animated these benefactors or the impact of their philanthropy upon the university curriculum, the manner of instruction, and the research opportunities at Oxford. This 'collective act of benefaction' will be analyzed in this essay in order to demonstrate that it was part of a major bid to set the intellectual life of Oxford on a new footing during the first decades of the seventeenth century. The success of this effort is reflected in the reformulation of the nature and character of both undergraduate and graduate learning at Oxford that took place at this time.

The motives that prompted the largest benefactions may be divided roughly into two groupings: personal motives and scholarly motives. The former reflected the desire of donors to immortalize their names, while the latter was an expression of their concurrent genuine concern with promoting learning. And although scholarly motives certainly played an important role in determining the ultimate selection of the discipline to be promoted, the actual act of benefaction, that is, the event that set in motion the entire process, can invariably be found within the domain of the personal.

By far the most important personal attribute to link virtually all great benefactors was their failure to produce a male heir. William Camden, Henry Danvers, Lord Danby, Thomas White, and William Laud never married, while Sir Thomas Bodley and Sir Henry Savile left no surviving male issue. No great psychological acumen is needed to realize that in their twilight years these men were opting for an alternative route to immortality; their fortune would be translated into an everlasting tribute to their memory at the university. Certainly, this general pattern was familiar, and had a long and glorious tradition during the Middle Ages. These great benefactors, however, introduced a novel and important variant; they made a conscious effort to employ their wealth not only for the purpose of carrying on the family name, but equally important, to implement some of their convictions concerning the advancement of learning.

Even projected endowments that failed to materialize bear evidence to the crucial correlation between the desire to encourage scholarship on the one hand, and the ability to dispose of one's wealth for this purpose, on the other. Not surprisingly, the major limitation, time and again, was family opposition. Sir Edwin Sandys, for example, stipulated in his will (1628) his explicit wish to establish a professorship of metaphysics at Oxford. Yet, not only did Sandys die heavily in debt, but he also left some offspring who preferred not to honor their father's wish—and part with £1,800. An even more spectacular case involved the enormous benefaction of Sir Thomas Gresham stipulated in his will of 1579 to establish a college in London. Gresham's second wife tried everything in her power—including an act of Parliament—to contest her husband's will and divert the money instead to her children from a previous marriage. Although her efforts failed, her persistence illustrates the extent to which family members were willing to go to reverse a benefaction.¹ In this category can also be included the failed attempt of Fulke Greville, Lord Brooke, to establish a history professorship at Cambridge. His heir, Robert Greville, Second Lord Brooke, never went beyond expressing verbal sympathy for his cousin's wish to support such a professorship. Quite possibly, he exploited the furor created by the lectures of the first incumbent, Isaac Dorislaus, to wash his hands of the intended endowment.²

This strong correlation between lack of a male heir and a desire to leave a testament to one's name applies mainly to large benefactions. Many made more modest gifts to the universities, regardless of whether they left male offspring. Such gifts came in the form of occasional scholarships or fellowships; augmentation of fellows' salaries; or even provisions of small sums to allow existing college fellows to lecture on specific topics within their respective houses. But these gifts invariably fell far short of the funds necessary to achieve the goals of Savile and his counterparts, since the cost

of endowing chairs was staggering. Both Savile and Camden left Oxford with lands valued at close to £8,000, while Thomas White and Sir William Sedley each provided close to £2,000 to establish their respective chairs. Such sums were mandatory since the annual salary designated for a Professor represented roughly 5% of the value of the land intended to support the chair. Moreover, since a major purpose of these endowments was to provide generous remuneration for the incumbents—never less than £100 per annum—it was clear that only a substantial benefaction could bear the expense.

An intriguing aspect of this 'collective act of benefaction' involves the close personal ties that existed between the various benefactors. Clearly, a shared experience translated into a shared example of philanthropy. At the very least these men were contemporaries and members, past or present, of the universities they supported. The ties, however, usually went deeper, and a significant number were close friends. Bodley, Savile, Camden, and White—all of whom were born between 1545-1551—studied together at Oxford during the first decade of Elizabeth's reign and retained their close ties, to their university and to each other, throughout their lives.

In this context of shared friendship and shared aspirations Sir Henry Savile emerges as the initiator and role model for most subsequent benefactors. In 1619, the seventy-year old Warden of Merton College and Provost of Eton endowed two professorships (of astronomy and geometry) at Oxford, personally selecting the first two incumbents and setting down in minute detail statutes regulating the two chairs. The previous decade Savile had already played a major role in assisting Sir Thomas Bodley to establish the Bodleian Library, and quite possibly had even been instrumental in prompting Bodley to endow Oxford with a public library in the first place. In a similar manner, in 1618 Savile convinced Sir William Sedley to endow his professorship of natural philosophy at Oxford. In Sedley's case this solicitation helps explain the seemingly 'anomalous' benefaction, since Sedley alone among the benefactors had a male heir. But even this exception seems less exceptional when it is realized that the son and heir, Sir John Sedley, was Savile's son-in-law, and the chair was (one may surmise) the 'price' Sedley senior had to pay for the hand of Elizabeth Savile—Sir Henry's only child.

The important and explicit example set by Savile most probably served as a pattern of benefaction for Savile's two contemporaries at Oxford, William Camden and Thomas White. The successful foundation of the Savilian professorships in 1619 was clearly the model William Camden sought to emulate when, three years later, he contemplated establishing his history professorship. True, a letter from Savile to Camden shortly after the latter had intimated to Lord Paget his intention to endow the professorship at Oxford

suggests that Savile was not specifically consulted; but such an oversight on Camden's part does not negate the influence exerted by Savile's successful foundation upon his friend of fifty years standing.³ In a similar manner, the foundation of White's Professorship of Moral Philosophy in 1621 and of the Laudian Professorship of Arabic fifteen years later reveal a modeling after the Savilian chairs. Indeed, the existence of a 'Savilian pattern' was recognized and encouraged by contemporaries. Henry Briggs, for example, the first Savilian Professor of Geometry, busily circulated the Savilian statutes as part of his search for a benefactor who might be persuaded to follow Savile's footsteps and endow similar chairs in Briggs' own alma mater—Cambridge University.⁴

Although these large benefactions to Oxford fit into an existing mode of philanthropy in that they promised an alternative route to immortality, they nonetheless assumed a unique shape. The medieval period, especially in England, provided little precedent for the spate of professorial endowments of scholarship. Far more common was the practice on the part of large benefactors to establish a college, which may or may not have designated the instruction of certain subjects by specific fellows. In fact, before the early seventeenth century, the only precedent for endowed professorships was Henry VIII's establishment of the five Regius professorships in 1540.⁵ What our benefactors did, then, was to copy the princely example of an endowed chair in order to place the traditional framework of university benefaction on a new footing; instead of establishing a new college, or contributing a substantial sum for the reconstruction of an existing house, they chose to support one discipline and one professor. Further to differentiate these new endowments from even these princely examples was that while the Regius professorships were intended to support almost exclusively the three professions of theology, medicine and law, the new chairs represented the first serious attempt in England to encourage 'secular' scholarship, which was not directed to the above three higher faculties. In this way the founders of these chairs sought to enlarge the pool of vocational learned disciplines. And it is here that the uniqueness of these benefactions lies. By supporting either disciplines not hitherto officially represented in the curriculum (such as history or Arabic), or disciplines hitherto considered mainly preparatory for the pursuit of the professions, these benefactors helped to create a new set of academic priorities. And even if these new foundations were not intended as an immediate challenge to the existing hierarchy of knowledge, by ensuring the future prosperity of these heretofore 'subservient' disciplines, they nonetheless initiated the long process that would lead to their emancipation. Such was the beginning of a clear and effective campaign to re-order the disciplines

and elevate certain among them to a position of unprecedented dignity.

This long-term purpose was explicitly articulated by some of the benefactors. At the outset of the statutes he had formulated for his two chairs, for example, Sir Henry Savile stated that he had endowed the chairs having seen

that Mathematical studies are uncultivated by our countrymen, and being desirous of supplying a remedy in a quarter almost given up in despair, and to redeem so far as in [him] lies, almost from destruction, sciences of the noblest kind.⁶

Some historians have interpreted this mission statement as an expression of strong criticism on Savile's part, and thus evidence of the absence of all mathematical instruction in English universities. Such an inference, however, is unjustified.⁷ More accurate would be to interpret it as an expression of Savile's awareness of the great advances that had taken place in mathematics during the previous century, and his subsequent realization that only a new structure would enable it to flourish. The existing disciplinary infrastructure, Savile seems to be making clear, was incapable of supporting and sustaining fields of study that either strove to be self-sufficient or were not directly or overwhelmingly relevant to the three professions.

Concomitant with this campaign to encourage non-professional, secular scholarship was an attempt to impose new procedures that would safeguard this minor revolution. To this end our benefactors applied two novel concepts: first, they sought to elevate the social status and calibre of the incumbents of the chairs by instituting a most generous system of remuneration (which in many cases promised salaries higher than those enjoyed by the Regius professors)⁸; second, they made explicit stipulations prohibiting the professors from practicing any other profession while occupying the chair. In other words, our benefactors helped initiate the slow process of secularization and professionalization of the disciplines, a process which—for various reasons—would later suffer setbacks and only reach fruition during the nineteenth century.

From the outset remuneration was perceived as the crucial component in any major campaign to alter past perceptions and prejudices; only a secured position that promised both respect and a handsome stipend would attract the best candidates, ensure that the incumbents devoted their full time and energy to their duties, and encourage their best contribution to their respective areas of scholarship. The result of such an initiative would be to make the new professors at least 'equal' in terms of university standing to the old guard. Thus, our benefactors went out of their way to guarantee the most liberal terms of employment. In comparison to the annual salary of £40 stipulated for the Regius professors ever since 1540, the new professors received more than

twice that £100 p. a. for the White professor; £140 for the Camden professor of History; £160 for the Savilian professors; and, had Sir Francis Bacon's endowment for a professor of natural philosophy materialized, its incumbent would have drawn an annual salary of £200.⁹ Such a rationale of handsome wages was understood perfectly well by Archbishop Laud, who not only intended to endow most liberally his professor of Arabic (on whom he managed to settle the minimum of £100 p. a. while awaiting his trial), but years before Laud had taken steps to augment the now meagre salaries of the Regius Professor of Hebrew by annexing to the chair a canonry of Christ Church.¹⁰ This thrust toward generous 'terms of employment' bore fruit and resulted—at least during the seventeenth century—in a highly qualified body of professors, the calibre of whom often exceeded that of the Regius professors. Content in their offices, they were not easily lured by either promise of honor or luxuries elsewhere.

But generous salaries guaranteed more than just quality and stability in the various chairs; they ensured the incumbents a position of respect both among colleagues at university and outsiders. Indeed, it is impossible to ignore the significance of the emergence of a certain 'professional' class of teachers at the universities precisely at the moment when college tutors were slowly engrossing all teaching duties. It is even possible to argue that at least as regards the seventeenth century, this development modified, maybe even halted, such a process, as many of the professors were talented, responsible, and certainly not absentees—men who felt sufficiently privileged and comfortable in their positions to carry out faithfully the wishes of the founders of their respective chairs.

As important as salaries and prestige were in attracting capable and responsible incumbents and in preventing split loyalties, they alone would have been insufficient to ensure the revolution initiated by our benefactors. In order for a discipline to come into its own, it was crucial that the cord that traditionally tied all scholarship to a higher purpose—and particularly to theology—be severed. And this brings us to the connection between scholarship and the church. For hundreds of years scholars had been rewarded by livings and dignities within the church hierarchy simply because few other forms of permanent remuneration existed. Problematic about such church positions, however, was the inevitable clash they involved between devotion to secular learning and devotion to one's 'higher calling'—to God and to one's flock. Most new endowments, therefore, made it explicit that only persons not holding other positions—and church livings especially—would be eligible for professorships. The most extreme formulation was made by Fulke Greville in his rules for the abortive professorship of history at

Cambridge:

None shalbe eligible that is in holie Orders. As well because this Realme affordeth manie preferments for divines, fewe or none for Professors of humane learning, the use and application whereof to the practice of life is the maine end, and scope of this foundation: and also because this Lecture must needs hinder a Divine from the studies and offices of his callinge, due to the church.

Greville went on to exclude those 'that hath anie charge of wife or children, or anie office and imployment *necessarily distracting him from his studies*.'¹¹

This strong statement should not be interpreted either as a Puritan challenge to the Church of England or, conversely, as a calculated ploy to exclude divines altogether. Rather it was a safeguard against any attempt to turn the chair into a sinecure. Greville, like Savile, had the same sound notion of ensuring the autonomy of the discipline he wished to promote as well as the freedom and dignity of his professor. That Greville excluded all people in holy orders from competing for the chair was, I believe, more a sign of his failure to think out the implications of his formulation. Significantly, other benefactors merely stipulated that no one holding another preferment could be appointed. For example, Savile allowed his professors to be elected out 'of any order or profession' forbidding them only 'to accept any ecclesiastical benefice after their admission, with cure or without cure . . . or the headship of any college . . . or any public office in the University.'¹²

To be more restrictive than this was hardly possible in the English context, owing to the peculiar collegiate system at Oxford and Cambridge and the stipulations issued by the founders of chairs. The statutes of all professorships stipulated a minimum age of twenty-five prior to election. By this age, most English scholars would have been expected to be well beyond their MA, most likely in possession of a college fellowship and—in accordance with the statutes of every college—pursuing theology. Indeed, all scholars were required either to take holy orders within a few years of graduating MA or to vacate their fellowships. Although exceptions existed, as some colleges provided for one or two 'secular' fellowships intended for those pursuing medicine or civil law, even in such cases there was an implicit assumption that eventually these fellows would either take orders or resign their fellowships. Most important, in the highly charged religious atmosphere of the period, even an innocent wish to proceed with a 'secular' fellowship without taking orders could be easily interpreted as an indication of subversive religious beliefs, whether Catholicism or atheistic leanings. The tendency, therefore, was not to risk censure and instead take orders.

Yet, even after the new endowments, the number of chairs remained so

low—and the possibility of future openings so uncertain—that no individual could afford to wait for a vacancy. Even someone most eager for a professorship had to be certain of a living elsewhere. Hence, the numerous examples of serious scholars who took up holy orders and church livings only to resign them upon election to a professorship. Henry Gellibrand did so *en route* to becoming Gresham Professor of Astronomy, and John Wallis before his appointment as Savilian Professor of Geometry. For his part, Brian Twyne, expecting a quick reversion of the Camden Professorship of History, meanwhile resigned his church living. But while a living could be easily resigned, holy orders could not be reversed. It was this aspect of a scholar's predicament that Greville perhaps failed to appreciate in his efforts to 'professionalize' history; he confused the desirable with the possible. Had his professorship continued to exist, its electors would have found it almost impossible to find those qualified candidates Greville wished to attract from among English scholars who were not also divines.

Earlier it was claimed that Sir Henry Savile was instrumental in prompting the wave of endowments that, in turn, generated a new type of incumbent—a well-qualified specialist who was secular in orientation. A careful reading of the Savilian statutes reveals that Sir Henry initiated further innovative features for his—and other—chairs. Perhaps most important, he left the content, form, and method of instruction largely to the discretion of the Professors. Anticipating that the new foundations would attract mature and well-qualified persons, Savile made a conscious effort not to restrict future incumbents, instead allowing them latitude in determining content and pace of instruction. Thus, although his statutes prescribed a few obvious authors as a point of departure for his Professors, they appealed to future incumbents to incorporate the works of contemporary and future authors whenever appropriate to the subject at hand.¹³ With similar latitude Greville would have allowed his reader to choose between secular and ecclesiastical history as well as on texts and methods of instruction. This relative freedom, though perhaps well motivated, nonetheless sometimes had adverse consequences. Since it was customary for statutes to contain some stipulations vis-à-vis the intended curriculum of the various disciplines, when no stipulations were set down (as was the case with White's Chair of Moral Philosophy and Sedley's Professorship of Natural Philosophy), the compilers of the new Laudian statutes simply resorted to the traditional, standby formulations, introducing to this end a cryptic reference about the need to follow Aristotle which—to us today—makes little sense in terms of what was actually taught. Hence, the anomalous situation whereby White's ordinances for his lectureship contain no specification about the course of study, but the statutes stipulate that the reader

lecture on 'the Ethics of Aristotle to the Nichomachus, the Politics and Economics, expounding the text, and tersely resolving the questions as they arise out of Aristotle's text.'¹⁴ And I shall return to this important point later.

Another innovative contribution introduced by Savile was his provision for an auxiliary apparatus facilitating both instruction and research. First and foremost was his erection of an adequate library for the use of both Professor and auditors. For the benefit of the Savilian Chairs of Astronomy and Geometry, Savile created a sub-library, within the Bodleian, which housed the scientific books and manuscripts he had bequeathed for the use—and under the supervision—of the occupants of his chairs.¹⁵ Given Savile's emphasis on a library as part of the requisite teaching apparatus, it is not surprising that he sought to convince William Camden to endow the History Professorship with a similar resource:

One thing more I will be bold to persuade you, that to the use of your Readers you would bequeath your Books of that faculty. I for my part have cleared my study of all the Mathematical Books, which I had gathered in so many years and Countreys, Greek and Latin, printed and manuscript, even to the very raw Notes, that I have ever made in that argument . . . The Schools now are very large and fair, and place there may be conveniently found to set up a press with locks capable of them.¹⁶

However, Camden failed to appreciate the importance of Savile's suggestion—or perhaps he felt obliged to carry out his original intention to bequeath his library to Sir Robert Cotton—and thus the Camden Professor had to rely on his own, as well as the Bodleian's, resources.

Nor did Savile stop with books. A talented mathematician and astronomer himself, Savile appreciated full well the changing nature of astronomy. Hence, he instructed his professors of astronomy to engage in actual observations of the heavenly bodies with proper instruments and presented to them his own collection of astronomical instruments, which would later be used and augmented by subsequent professors.¹⁷

With lectures, a library, and instruments provided for, Savile's final concern was with posterity, specifically the legacy of his professors. To this end he stipulated that the lectures delivered by his two professors, together with the observations made by the astronomy professor, be transferred into proper form and subsequently deposited in the Bodleian Library where they could be inspected and used by all interested in the subjects, and perhaps eventually published. Such a stipulation expressed in the form of 'making the fruits of their studies public,' certainly went a long way in initiating the concepts of 'research' and 'publication' as part of a professor's duties beyond the traditional task of instruction. Savile, in other words, insisted on the dual

function of a 'modern' university: to instruct the young in both ancient and contemporary learning; and to contribute to the advancement of knowledge. While perhaps not the first to envisage such goals, by virtue of his foundation Savile was the first to interject such convictions into the university statutes. Equally important, subsequent founders adopted such concepts and integrated them into the professorships they established. Sir Fulke Greville, for example, required that his reader 'shall yearly exhibit a copie of his whole yeares Readings . . . to be layd upp, and kept in the University Library to be published, if they shall think them meet.' A similar demand was applied to the Lucasian professors after the Restoration.¹⁸

Even in terms of teaching duties, Savile placed his professorship on a new footing. He stipulated that his professors make themselves available to students outside lecture hours. Thus, the geometry reader was requested 'at his own times . . . to teach and expound arithmetic of all kinds, both speculative and practical; land-surveying, or practical geometry; canonics or music, and mechanics.' The same professor was also requested to devote an additional hour each week for the instruction of all those interested

in practical logic or arithmetic of all kinds, which is best communicated without any formality, and in the vulgar tongue if he thinks fit. And also, that at convenient seasons, when it is agreeable to him, he shall show the practice of geometry to his auditors . . . in the fields or spots adjacent to the University.

While this concern with instruction undoubtedly formalized past practices of Savile and his colleagues, by articulating it in the statutes he made what had previously been voluntary into a formal requirement. The proof of Savile's wisdom was the high level of instruction in the mathematical sciences at Oxford for the remainder of the seventeenth century.

To gauge the significance of these provisions in Savile's and the other new professorships, an appraisal of the larger framework of university teaching is required. In particular, the relevance of the official statutes to teaching practices must be addressed. Throughout the sixteenth and seventeenth centuries there existed the tendency to recycle prevailing ordinances concerning instruction whenever a new body of statutes was drawn up. Since the occasion for such codices was primarily religious and political, the matter of instruction was considered incidental and thus ancillary to the objective at hand. The Laudian statutes are no exception. When Archbishop Laud ordered a new body of statutes for Oxford in the early 1630s, the purpose of his reform was to ensure order and discipline, both civil and religious. For this reason, whenever the founders of chairs failed to specify the course of instruction they desired, the cryptic language of earlier promulgations was adopted. However, when a founder was careful to specify his wishes—as in the case of the

detailed Savilian statutes—Laud was happy to incorporate such ordinances into the new statutes *en bloc*.

Nonetheless I would argue, even when old formulations were used, as in the case of the lectureships in moral and natural philosophy, the newly established notion of the professor as the ultimate arbiter of the course of study prevailed. In the absence of any guidelines from either Sedley or White, the Laudian statutes tersely charged the professors of moral and natural philosophy to expound on the relevant books of Aristotle. Yet, the assigning of the Stagirite at a period when no comprehensive alternative existed was only natural; a course of philosophical studies wholly outside the Aristotelian framework was unimaginable. Still, the *spirit* of the statutes ensured that, expressed language notwithstanding, it was the professors' duty to relate—and expand upon—more recent work.

With this evolutionary aspect of the statutes in mind, it becomes easier to make sense of the seeming disparity between what was assigned by the statutes and what was practiced by the professors. Regardless of discipline, from the second half of the sixteenth century lecturers took increasing liberty with the content of their lectures. Although it is beyond the scope of this paper to discuss the way in which university teaching was conducted,¹⁹ in general professors synthesized both the introductory material necessary for beginners and the most recent contributions to their respective fields. In addition, they conveyed their own interests, enthusiasm and on-going research to their students, thus making the latter—at least in the scientific disciplines—junior partners in the process of collaborative research. Certainly, during the seventeenth century there were many talented professors—John Bainbridge, Henry Briggs, Seth Ward, John Wallis, Thomas Willis, Edward Pococke, Thomas Barlow and Henry Dodwell—who exposed students to new cosmologies, new subjects, and new trends in historical scholarship, thus contributing to the growing institutionalization of their respective disciplines. Moreover, by virtue of their maturity, competence, and lengthy occupation of their respective chairs, these professors were able to provide the stability and continuity so crucial for nurturing a succeeding generation. And, indeed, during the second half of the seventeenth century Oxford developed into one of the most stimulating scholarly communities in Europe, a community that helped prepare England for her crucial role in the intellectual and scientific revolutions of the age.

Within the general context of endowments at Oxford in the early seventeenth-century, the foundation of the Laudian Professorship of Arabic suggests both a close emulation of the previously discussed Savilian model as well as certain deviations. Like all other founders (save for Sedley) Laud had

no male issue. Yet, with the exception of Thomas White, Laud was the only cleric among the benefactors and, as such, cohered more to the medieval paradigm of the unmarried churchman who always contributed munificently to the English universities than to the Savilian model of 'lay' founders of the seventeenth-century. Another distinction was a function of the discipline Laud chose to endow. While all other new professorships institutionalized advanced teaching of already existing disciplines, the Arabic professorship represented a discipline hitherto absent from the university curriculum. Further to distinguish the Laudian professorship, it was geared (at least in principle) toward the study of theology.²⁰ Such an orientation notwithstanding, Laud envisaged the lectureship within a broader humanistic framework, conceiving of the study of theology based firmly upon philology, in the manner advocated by Erasmus, Scaliger and Selden. Hence his stipulation that all bachelors of arts, medical students included, attend the lectures.

Of Laud's motives in endowing the professorship, little is known. Certainly, the remarkable awakening of interest in the study of Arabic during the two decades prior to the foundation of the chair could not have but attracted the attention of the future Archbishop. In fact, the inauguration of Laud's presidentship of St John's College in 1611 coincided with the arrival at Oxford of Yusuf Abū Daqhān, or Josephus Abudacnus (Barbatus) as he was commonly known, a few months earlier. Having taught in Paris for some years—where Thomas Erpenius was among his students—Abudacnus came to Oxford armed with a letter of recommendation from Richard Bancroft, Archbishop of Canterbury, 'to the end [that] he might reade the Arabian tongue.' Sir Thomas Bodley added his own commendation of the Egyptian-born scholar entreating Thomas James, the first Bodley librarian, to help install Abudacnus at Oxford not only for the advantage of local scholars, but 'lest Cambridge should endeavour, as I make account they would, to draw him unto them.' Abudacnus remained at Oxford until 1613, teaching Arabic and other Oriental languages, and studying in the Bodleian Library where he composed his *Historia Jacobitarum*, published by Thomas Marshall in 1675.²¹

Even more consequential for the future of Arabic studies was the sojourn of Matthias Pasor at Oxford in the following decade. Fleeing from the Thirty Years War, the German scholar arrived to England in late spring 1624, having spent the previous year at Leiden, where he perfected his knowledge of Arabic by conferring with Thomas Erpenius. Shortly thereafter he left for Paris where he further improved his knowledge of the Arabic by studying under the Maronite Gabriel Sionita. He then returned to Oxford where he became, in the words of Henry Briggs, 'a very painfull and diligent reader for Arabicke and

Chaldee,' providing instruction both through public lectures and private tutorials.²²

In 1627 Pasor published the inaugural lecture he had delivered the previous year, in which he made a passionate plea for the endowment of a lectureship for the Oriental tongues at Oxford. Consciously perhaps, the lecture emulated, both in its structure and content, the oration delivered by Erpenius at Leiden 'On the value of the Arabic language.' Like Erpenius, but with less fervor, Pasor denoted the positive contribution of Islam to learning—not to mention the preservation of a large corpus of Greek writings in Arabic—in such subjects as mathematics, astronomy, medicine, history and poetry. Fully aware of the English predilection for theology, however, Pasor labored more than his mentor on the utility of Arabic for the study of scripture and more particularly, for the confutation of Catholicism. He argued explicitly that both the Greek and the Hebrew tongues had been bountifully provided for in recognition of their indispensable contribution to the 'true' elucidation of the Old and New Testaments. Likewise, maintained Pasor, the Oriental languages needed endowment; the study of Arabic and Syriac would not only help illuminate the Hebrew text, but would also enable the proper study of various Oriental texts of scripture—in a manner reminiscent of the important Latin translation of the Old Testament by Emanuel Tremelius and Franciscus Junius. Such a concentrated application to the Arabic, concluded Pasor, would bring about the purging of the 'Aegean stables of the superstition of the papacy and cleanse the filth of scholastic sophistry.'²³ Whether Pasor's eloquence or instruction actually affected the foundation of the Laudian Professorship a few years later is not clear. Evident, however, is the warm reception Pasor received at Oxford, and such a response prompted various scholars into action. Towards the end of 1627, Henry Briggs wrote his Cambridge friend, Samuel Ward, Master of Sidney Sussex College, that Pasor's lectures 'findeth diverse constante hearers' at Oxford, expressing the hope that the Chancellor of the sister university 'will set forwarde the like lecture withe you, and not permitt Erpenius his bokes to be spoiled for lacke of use.'²⁴

Laud could not have been oblivious to the wave of enthusiasm that swept Oxford. Fellows, heads of house and even young scholars gladly welcomed the opportunity to pursue the study of Arabic both for its contribution to the study of the Old and New Testaments—an over-riding motive behind much of English scholarship in the seventeenth-century—and for the light it shed on the languages, customs, and institutions of the ancient Near East. To a select few, however, the lectures provided a golden opportunity to gain insight into the scientific, medical and historical material available in Arabic manuscripts. Among these scientifically motivated students were Peter Turner,

John Greaves and John Bainbridge, whose close relations to Laud as well as other influential promoters of the language (such as James Ussher, Archbishop of Armagh and John Selden) no doubt proved instrumental in establishing an Arabic professorship at Oxford.

If Laud was only marginally interested in Arabic science, he was strongly predisposed toward the belief that Arabic and other oriental languages could be used for polemical purposes against Catholicism. For while he adhered to the 'divine and infallible revelation by which the originals of scripture were first written,' he did not allow such a conviction to preclude his endorsement of the recent fruits of higher criticism; in terms of biblical scholarship this was translated into an unwillingness to accept any manuscript as infallible. Only a close scrutiny and collation of sundry manuscripts, Laud concluded, could establish a 'true' text. Viewed in terms of such a conviction, Laud's patronage of both Oriental and Greek studies becomes understandable.²⁵

Indeed, even before the foundation of the Arabic chair, Laud exhibited his concern for oriental studies by annexing in 1630 a prebend at Christ Church to the office of the Regius Professor of Hebrew, an act that, in retrospect, drew Anthony Wood to exclaim that it was during the tenure of the first benefiting incumbent, John Morris, that the

Hebrew and Chaldaic Tongues which few in Oxford understood some years before became to be so cheerfully studied that it received a wonderful proficiency, and that too in a shorter time than a man could easily imagine; so great a spur the hope of honour and preferments give to Art and Languages.²⁶

Perhaps it is not amiss to append to our discussion yet another, more mundane and immediate, consideration that might have precipitated Laud into action. The general enthusiasm for things Arabic during the 1620s brought to bear considerable pressure from various quarters on influential courtiers and prelates to actively support the discipline. Laud's own former patron, George Villiers, Duke of Buckingham, was persuaded in 1625 to purchase the manuscripts of Thomas Erpenius; the following year, upon his appointment as Chancellor of Cambridge University, he was induced to donate the collection to the University Library. At least some of the individuals who influenced Buckingham into action—prelates such as Lancelot Andrewes, James Ussher and John Williams, and scholars such as Samuel Ward and John Selden—most certainly pressured Laud to act on behalf of Oxford. Be this as it may, in November 1630 Laud, then Bishop of London, drew a catalogue of 'Acts of Bounty' he projected to effect, and amongst these he resolved to 'Erect an Arabick *Lecture* in Oxford, at least for his Life-time, his Estate as he supposed not being able for more, that this may lead the way.'²⁷

Laud's exact design for a philology lectureship (subservient to theology)

is set out in the statutes he drew up. The professor was required to lecture for one hour every Wednesday during vacation and Lent, and afterward make himself available for students between one and four in the afternoon. As for content, the lecturer was expected to explain 'the work of some approved and ancient author, in which the proprieties of the language and the elegance of expression are remarkable.' In the course of such exposition they would provide

a clear explanation of the words and grammatical meaning of the author, and point out all that has a reference to the grammar and peculiarities of the language; and shall also show, whenever occasion offers, the agreement of the Arabic language with the Hebrew and Syriac.²⁸

Unlike Camden, Laud shared Sir Henry Savile's conviction that a good library was essential for his professors; and to this end he bestowed some 600 Oriental manuscripts on the Bodleian Library in the 1630s, thus establishing Oxford as a major European center for the study of Oriental languages.²⁹

Laud was fortunate in his choice of the first incumbent, Edward Pococke. Having obtained his MA in 1626, the young linguist from Corpus Christi College proceeded during the next year or two to learn all that Pasor could teach him before applying himself c. 1628-9 to William Bedwell for further instruction. Bedwell was also the person to recommend Pococke to Archbishop Laud, who ultimately interceded on the young man's behalf and was responsible for his appointment as Chaplain to the Levant Company's merchants at Aleppo, a post Pococke took up in 1630. Pococke stayed in the East for six years, vastly expanding his knowledge of Arabic and Hebrew and purchasing numerous manuscripts both for Laud and for himself. By 1634 the Archbishop had appointed Pococke as his first lecturer in Arabic at Oxford, and in 1636 the young orientalist leisurely made his way back to England. At Oxford, Pococke busied himself with preparations for his inaugural oration, scheduled for August 1636, and with inspecting and arranging the manuscripts Laud had dispatched to the Bodleian Library. He delivered his oration on 10 August 1636, and immediately proceeded 'with a course of lectures upon the proverbs ascribed to the Caliph 'Ali.' Despite his having just been appointed Professor, Pococke wished to return to the East, and within a year his Oxford friends Peter Turner and John Greaves were able to persuade Laud to consent. Pococke left England in the summer of 1637, returning only in 1641.³⁰

For the next fifty years, Pococke devoted himself to teaching, writing, and assisting the Oriental undertakings of all English Orientalists. The quality and profundity of his teaching can be gleaned both by his lecture notes and through a study of the extant library catalogues of some of his students. What emerges

is a devoted, conscientious teacher who provided a comprehensive and well-defined course. In contrast to his duties as Regius Professor of Hebrew, where Pococke could anticipate a relatively extensive background knowledge in his students, as Laudian Professor he was expected to teach basic grammar to many of his auditors. Thus there arose a two-tier system of instruction, for beginners and for advanced students.

The text with which Pococke launched his teaching career was the edition of 'Ali's proverbs published by Golius in 1629.³¹ As Holt demonstrates, Pococke used the text in conjunction with the two grammatical works compiled by Erpenius: *Rudimenta Linguae Arabicae* and the *Grammatica Arabica*. By the late 1650s Pococke also added, mainly for the use of the more advanced students, Golius's *Arabicae Linguae Tyrocinium*, basically a re-working of Erpenius's larger grammar that Golius had augmented with fresh material. By this time Pococke was already lecturing on another Arabic text published by Golius, the *Carmen Tograi*, a text that Pococke republished with an extensive commentary in 1661.³²

The *Specimen* and *Carmen Tograi* as well as the manuscript lecture notes discovered by Holt, attest to the diligence and thoroughness that animated Pococke's teaching of the Arabic. As was his custom with the Hebrew, Pococke assigned his students a short, pleasing, and relatively simple text; his lecture consisted of a meticulous analysis of nearly every word and concept in the text, accompanied by extensive etymologies and frequent comparisons to words and concepts in both Hebrew and Syriac. Occasionally, Pococke would digress by providing copious explanatory notes setting out the historical and cultural context of the text, or he would explicate on matters pertaining to the theological concerns of his auditors—most commonly in terms of scriptural exegeses.

The ownership of Arabic books by various Oxford students enables us not only to corroborate the information derived from Pococke's lecture notes and publications, but also to discern the divergence of motives that animated the various auditors. Most of the students who bothered with the Arabic did so as an extension of their Hebrew studies; most probably these students were furnished with grammar and vocabulary, and their reading material confined to scripture. Thus, Henry Stringer's donation of books to New College Library in 1654 is perhaps representative of the holdings of an amateur Arabist: an Arabic grammar; the lexicons of Raphelengius and Golius; Erpenius' Arabic New Testament and Gabriel Sionita's edition of the psalms.³³ The more aspiring students went further. Edward Bernard's 1658 catalogue of books demonstrates the full range of Pococke's teaching. Besides Golius' Arabic grammar, Greaves' Persian Grammar and two Syriac grammars, Bernard

owned the *Proverbia Ali*; Ravius' edition of a particular Surah of the *Qur'ān*; Pococke's *Specimen*; and Erpenius' *Historia Saracenica*.³⁴ Pococke was thus able to uphold both the letter and spirit of the vision that had animated Laud in endowing the Professorship of Arabic. While catering to the anticipated needs of the future theologian, the Laudian Professor was also able to offer a thoroughly 'secular' course for students who were interested more in philology, or for whom the study of Arabic was only an instrument for attaining the scientific knowledge hidden in the Arabic manuscripts that increasingly found their way to European libraries. Unfortunately, it is impossible to determine how many students took advantage of Pococke's teaching or to evaluate the depth of knowledge attained by students. All that may be ascertained is that a significant number of catalogues of Oxford scholars contain at least a couple of elementary books in Arabic, indicating the acquisition of at least the rudiments of the language.

Far more research is necessary in order to evaluate the exact modes of the teaching of Arabic at Oxford. At present it is only possible to suggest that the Laudian chair, together with the Savilian professorships, helped make Oxford one of the most important European centers for the study of Arabic and of the mathematical sciences. And as such, the chairs vindicated the wisdom and success of the men who sought to revolutionize the structure and content of English higher education by munificently endowing a series of professorships at Oxford in the early years of the seventeenth century.

NOTES

¹ John Ward, *The Lives of the Professors of Gresham College* (London, 1740), pp. 30-1.

² Greville kept the lectureship suspended even after Dorislaus was cleared of the charge of sedition, since he was indignant of the unauthorized use Dorislaus had made of the founder's letters. Greville continued, however, to pay Dorislaus his salary until his death in 1628. Ronald A. Rebholz, *The Life of Fulke Greville Lord Brooke* (Oxford, 1971), pp. 293-302; Hugh Trevor-Roper, 'Review Essay' of Christopher Hill's *Intellectual origins of the English Revolution in History and Theory*, p. 69. See also, Kevin Sharpe, 'The Foundation of the Chairs of History at Oxford and Cambridge: An Episode in Jacobean Politics,' *History of Universities*, 2 (1982), p. 127.

³ For Savile's letter to Camden, see Thomas Smith, *V. Cl. Gulielmi Camdeni et illustrium virorum ad G. Camdenum epistolae* (London, 1691), p. 313.

⁴ See, for example, Briggs's letter of 6 August 1621 to Samuel Ward, Master Of Sidney Sussex College, Cambridge, in Bodl. MS. Tanner 73, fol. 68.

⁵ For these, see F. Logan, 'The Origins of the So-called Regius Professorships,' in *Renaissance and Renewal in Christian History, Studies in Church History*, ed. D. Baker, 14 (Oxford, 1977), pp. 271-8.

⁶ *Oxford University Statutes*, trans. G. R. M. Ward, 2 Vols. (London, 1845), I, p. 272.

⁷ For a more elaborate discussion of the place of science in the universities, see my

The Mathematicians' Apprenticeship: Science, Universities and Society in England, 1560-1640 (Cambridge, 1984) and 'The Universities and the Scientific Revolution: The Case of England,' in *New Trends in the History of Science*, eds. R. P. W. Visser et al. (Amsterdam, 1989), pp. 29-48.

⁸ On the Continent, of course, there were earlier precedents for the foundation of professorships. Most relevant, perhaps, is the successful experiment carried out at Leiden to attract the most prominent scholars. But the English foundations were unique in the fact that all chairs were established by private individuals, with neither the university nor the monarch (or the state or the town) contributing anything toward the fulfilment of the project.

⁹ For Bacon's intended endowment, see T. Bass Mullinger, 'The Relations of Francis Bacon, Lord Verulam, with the University of Cambridge,' *Publications of the Cambridge Antiquarian Society*, 9 (1896-8), p. 233.

¹⁰ *The Works of . . . William Laud*, eds. W. Scott and J. Bliss, 7 Vols. (Oxford, 1847-60), V. 19, pp. 23-4.

¹¹ James B. Mullinger, *The University of Cambridge*, 3 Vols. (Cambridge, 1873-1911), III, p. 676, italics added.

¹² Ward, *Oxford University statutes*, I, p. 277, 281. White's lecturer in moral philosophy was to be 'unengaged in any ecclesiastical function or cure of soul elsewhere.' *Ibid.*, I, p. 285.

¹³ See, for example, his instructions to the Professor of Astronomy to expound on Ptolemy, Geber, Copernicus 'and other modern writers.' Ward, *Oxford University Statutes*, I, p. 273.

¹⁴ Ward, *Oxford University Statutes*, I, pp. 285-7, 20-1. The same occurred with the Sedleian Professorship. The founder did not provide even an ordinance, so the Laudian statutes stipulate that the lecturer expound on 'Aristotle's Physics, or the books concerning the heavens and the world, or concerning meteoric bodies, or the small Natural Phenomena of the same author, or the books which treat of the soul, and also those on generation and corruption.' *Ibid.*, I, p. 22.

¹⁵ Ward, *Oxford University Statutes*, I, pp. 272-3. A generation later, when Sir Henry Lucas founded his Professorship of Mathematics at Cambridge, he, too, bequeathed his library to the university for the use of his professors.

¹⁶ Smith, V. Cl. *Gulielmi Camdeni et illustrium virorum ad G. Camdenum epistolae*, p. 315.

¹⁷ For a list of the instruments and books c. 1640, see Trinity College Dublin, MS 383 fols. 142-143v.

¹⁸ Ward, *Oxford University Statutes*, I, p. 272; Mullinger, *The University of Cambridge*, III, p. 677; J. W. Clark, *Endowments of the University of Cambridge* (Cambridge, 1904), pp. 167-8.

¹⁹ For a detailed discussion of both theory and practice of university education in the seventeenth century, see my forthcoming 'The Arts Curriculum in the Seventeenth Century' in *The History of the University of Oxford: The Seventeenth Century*, ed. Nicholas Tyacke (in press.)

²⁰ For a fuller discussion of the Laudian Chair and of Oriental studies at Oxford in the seventeenth century, see my 'The Oxford Oriental School' in *Ibid.*

²¹ Wood, *Fasti Oxonienses*, I, pp. 301-2; Alastair Hamilton, *William Bedwell The Arabist* (Leiden, 1985), pp. 34-7; *Letters of Sir Thomas Bodley to Thomas James*, ed. G. W. W. Wheeler (Oxford, 1926), pp. 193-4, 196.

²² Anthony Wood, *Athenae Oxonienses*, ed. P. Bliss, 4 Vols. (Oxford, 1813-20), III, pp. 444-6; *Idem.*, *Fasti Oxonienses*, I, 416; Bodl. Ms. Tanner 72, fol. 228.

²³ Pasor, *Oratio pro Linguae Arabicae Professione* (Oxford, 1627).

²⁴ Bodl. Ms. Tanner 72 fol. 211. Briggs referred to the purchase of Erpenius' manuscript by the Duke of Buckingham, which was presented to Cambridge Univer-

sity Library by Buckingham's widow following the Duke's assassination.

²⁵ H.R. Trevor-Roper, *Archbishop Laud 1573-1645*, 2nd ed. (London and New York, 1965), pp. 273-84; *Idem.*, 'The Church of England and the Greek Church in the Time of Charles I,' in *Religious Motivation: Biographical and Sociological Problems for the Church Historian*, ed. Derek Baker (London, 1978), pp. 213-40.

²⁶ *The Works of . . . William Laud*, eds. W. Scott and J. Bliss, 7 vols. (Oxford, 1847-60), V, p. 19. For Morris' effusive letter of thanks see *Ibid.*, V, pp. 23-4; Anthony Wood, *The History and Antiquities of the University of Oxford*, ed. J. Gutch, 2 vols. in 3 (Oxford, 1796), III, p. 850.

²⁷ John Rushworth, *Historical Collections* (London, 1721), II, i, p. 74. Trevor-Roper advances the further useful conjecture that 'the immediate incentive, however, was probably Laud's desire to secure the services of Edward Pococke, which might otherwise have been diverted to the Netherlands, or wasted in the desert.' Trevor-Roper, *Archbishop Laud*, p. 282.

²⁸ Ward, *Oxford University Statutes*, I, p. 295; *The Theological Works of the Learned Dr. Pocock*, ed. L. Twells, 2 Vols. (London, 1740), I, pp. 9-10 (of the 'Life of the Author').

²⁹ Ward, *Oxford University Statutes*, I, p. 295.

³⁰ Twells, 'Life of Pocock,' p. 2; Trevor-Roper, *Archbishop Laud*, p. 282; Hamilton, *William Bedwell*, p. 53; *PRO* SP 16/329/30; 16/381/75; P. M. Holt, 'An Oxford Arabist: Edward Pococke (1604-91),' in his *Studies in the History of the Near East* (London, 1973), pp. 3-26.

³¹ *Proverbia quædam Alis Imperatoris Muslemici*, ed. Jakob Golius (Leiden, 1629).

³² Twells, 'Life of Pocock,' pp. 58-9; Holt, 'An Oxford Arabist,' pp. 6-7.

³³ New College, Oxford, Benefactors Book, p. 84; Samuel Lee (MA Magdalen Hall, 1648) owned an Arabic Testament and Golius' lexicon.

³⁴ Bodl. Ms Lat. Misc. f. 11, fols. 13v-17.

COLIN WAKEFIELD

ARABIC MANUSCRIPTS IN THE BODLEIAN LIBRARY:
THE SEVENTEENTH-CENTURY COLLECTIONS

When the Bodleian Library opened its doors to the public in 1602, it possessed only one Arabic manuscript, but by the end of the period under review its holdings of Arabic manuscripts amounted to something in the region of one thousand five hundred volumes, covering all the various traditional fields of Arabic learning. The manuscripts acquired at that time are remarkable in terms of both quality and quantity and still today are the centre-piece of the Bodleian's Arabic resources. They came by gift, purchase and bequest, sometimes singly or in small numbers, sometimes in large collections of several hundreds. The collectors were ambassadors and merchants with Near Eastern connections, amateur Arabists, churchmen and scholars.¹ A brief account is given of the activities of the major collectors and the strengths of their respective collections are discussed. A number of important or noteworthy items are singled out for special mention. The survey extends a little beyond the end of the seventeenth century so as to include the bequest of Narcissus Marsh. Although Marsh's collection of manuscripts was received in 1714 it is best considered along with the seventeenth-century collections. It was assembled at the end of that century and owes much to the activities of other well-known seventeenth-century collectors.

The one Arabic manuscript in the Bodleian at the time of its opening was a Qur'ān which was given by John Wrothe in 1601.² Thereafter, during the first decade of the Library's existence, few Arabic manuscripts were acquired despite the fact that the founder, Sir Thomas Bodley, was eager to obtain materials in Arabic and other Near Eastern languages. In a letter to his librarian, Thomas James, in June 1603, Bodley confesses to his disappointment at not being able to obtain books from 'Turkie'. He goes on to express his intention of sending a suitably qualified 'scholler of sette purpose, who is very well studied both in the Hebr. and Arabicke tongues, whose errand shall be onely, to seeke out books for the Libr.'³ Bodley himself, it may be remarked, besides his knowledge of Greek and Latin and several modern European languages, was a competent Hebraist.⁴ His plan to acquire Arabic

and other Near Eastern materials was evidently not put into effect. The inflow of Arabic manuscripts remained at a trickle. In 1604 a manuscript containing two Arabic commentaries on a work of logic was given by Sir George Moore, who also presented a number of Western manuscripts.⁵ A miniature Qurʾān was donated by Sir Henry Wotton in 1604,⁶ and in 1606 another Qurʾān was given by Thomas Cutler.⁷ A copy of the Psalms in Arabic was given in 1609 by William Herbert, Earl of Pembroke, who was later Chancellor of the University of Oxford.⁸

It was around this time that Bodley approached the consul of the English merchants in Aleppo, Paul Pindar, for help in the acquisition of manuscripts from the Near East. The circumstances of his approach and the outcome are described in a letter from Bodley to the Vice-Chancellor of the University which was read out in Convocation on 9 November 1611.

Sir About some three yeares past, I made a motion heere in London to Mr Paule Pindar Consull of the Company of the Englishe Marchantes at Aleppo a famous port in the Turkes dominions: that he would vse his best meanes, to procure me some bookes in the Syriacke, Arabicke, Turkishe and Persian tongues, or in any other language of those Esterne nations: bycause I make no doubt but in processe of time, by the extraordinarie diligence of some one or other student they may bee readily vnderstoode, and some speciall vse made of their kinde of learninge in those partes of the worlde. And where I had a purpose to reimburse all the charge, that might growe therevpon he sent of late vnto me twentie severall volumes in the foresaid tongues and of his liberall disposition hath bestowed them freely on the Librarie. They are manuscripts all (for in those cuntries they haue no kinde of printing) and were valued in that place at a verie highe rate.⁹

The Arabic manuscripts in the Pindar donation were eight in number and of diverse content: two Biblical manuscripts,¹⁰ a copy of Ephraim Syrus' works,¹¹ a treatise on the interpretation of dreams by al-Dīnawarī,¹² al-Zamakhsharī's *Muqaddimat al-adab*,¹³ and three medical manuscripts of which one is a copy of Ibn Hibāt Allāh's *al-Mughnī fī tadbīr al-amrād*, dated 676 A.H.¹⁴

When Sir Thomas Bodley died in 1613 the Library's Arabic resources were still meagre, and the situation was little different when in 1626, the Heidelberg mathematician and Arabist Matthias Pasor described the Arabic materials, printed and manuscript, to be found in the Library. He mentions only six Arabic manuscripts, four of them Qurʾāns, and alludes to others without identifying them.¹⁵ At this date the overall number was probably nineteen.¹⁶ In the following decade a further handful of Arabic manuscripts was presented to the Library, of which mention might be made of a legal work, the *Kitāb al-Mabsūṭ* of al-Shaybānī, given in 1627 by Edmund Grayle,¹⁷ and perhaps the most celebrated accession of this period, the Arabic version of the

early Church Councils presented by Sir Thomas Roe in 1629.¹⁸ Roe was ambassador at Constantinople from 1621-8 and obtained this manuscript from the Patriarch of Constantinople Cyril Lucaris. He set great store by it, valuing it more highly than the famous Codex Alexandrinus, the early fifth century manuscript of the Greek Bible which the Patriarch, through Roe, presented to King Charles I.¹⁹

At the end of this first phase in the development of the Bodleian's Arabic collections, the manuscripts amounted to barely two dozen, a heterogeneous group quite inadequate as a resource for serious Arabic studies. But in the years 1635-40 the Arabic collection witnessed a substantial increase as a part of the remarkable general expansion of the Library's holdings occasioned by the patronage of William Laud, Archbishop of Canterbury and Chancellor of the University. Between these two dates Laud presented to the Library over one thousand manuscripts in four separate donations.²⁰ Just under a quarter of the whole is in oriental languages, including such rarities for the time as Ethiopic, Balinese and Malay. Of the oriental items 147 are Arabic manuscripts, whilst Persian and Turkish account for seventy-four and Hebrew forty-seven. Laud was not himself an orientalist but was keen to promote oriental studies in the University. He obtained a royal letter to the Levant Company requiring that each of their returning ships should bring back one Arabic or Persian manuscript. The letter explicitly excluded Qur'āns of which the Library already had a number of copies.²¹ In addition, Laud commissioned Edward Pococke and John Greaves to provide manuscripts for the Library during their visits to the Near East. In a letter addressed to Pococke at Aleppo, dated 30 October 1631, Laud charged him to buy 'such antient Greek coins, and such manuscripts, either in Greek or in Oriental languages, as in his judgement may best befit an university library.'²² How far Pococke was successful in supplying Laud we do not know. Twells mentions a letter of 21 May 1634 in which Laud thanks Pococke for acquiring Greek coins but there is no word of manuscripts having been received, and Laud again asks Pococke to let him know if anything worthwhile at a reasonable price turns up.²³ Written into one Laudian manuscript is a Latin note to the effect that it was bought by John Greaves in Constantinople in 1638 and that it and many others in Arabic, Persian, Greek and Latin were presented to Laud by Greaves.²⁴

Notwithstanding its diverse origins, the Laudian Arabic collection contains representatives of most areas of traditional Islamic learning: Qur'āns and parts of Qur'āns (despite the prohibition mentioned earlier),²⁵ Qur'ānic commentaries, works on law, grammar, lexicography (al-Firūzābādī²⁶), medicine (Galen,²⁷ al-Rāzī²⁸ Ibn Sīnā,²⁹ Ibn al-Bayṭār,³⁰) astronomy (Ibn al-Bannā',³¹ Ibn al-Shāṭir³²), proverbs (al-Maydānī³³), poetry, the occult and a copy of pseudo-Aristotle, *Secretum secretorum*.³⁴ Historical texts feature

strongly,³⁵ among them works by al-Ṭabarī,³⁶ Imād al-Dīn al-Iṣfahānī,³⁷ al-Makīn,³⁸ three volumes of Ibn Khallikān,³⁹ five volumes of al-Dhahabī's, *Ta'riḫ al-Islām*,⁴⁰ al-Ṣafadī⁴¹ and pseudo-al-Wāqidi.⁴²

Closely associated with the Laud collection is the small collection of thirty-six oriental manuscripts formerly belonging to Sir Kenelm Digby (1603-65).⁴³ They were received at the Library in 1640 through Laud and with his manuscripts into which they were mistakenly incorporated. They were not recognized as Digby's until 1656 and not separated from the Laudian manuscripts until about 1885. Thirty-one of the thirty-six are Arabic, representing a mixture of subjects; religion, literature, history, astrology, medicine, magic--some at least reflecting the philosophical and scientific interests which Digby pursued in his lectures at Gresham College and at his house in Covent Garden.

The two decades after the last Laudian benefaction in 1640 saw the acquisition of only a small number of Arabic manuscripts. A copy of al-Jawharī's *al-Ṣiḥāḥ* in two volumes was presented in 1640 by Phillip Williams, a London 'Turkey merchant'. The volumes are inscribed 'Constantinopoli Feb. 13, 1639.'⁴⁴ The following year a volume of al-Firūzābādī's *al-Qāmūs* was presented by another London Turkey merchant, Thomas Perle.⁴⁵ Of the few remaining accessions of this period we might mention a copy of al-Bukhārī's *al-Ṣaḥīḥ*, given in 1657 by Archbishop William Juxon.⁴⁶

In 1659 the Bodleian Library received by bequest the collection of over eight-thousand volumes of manuscripts and printed books belonging to John Selden (1584-1654).⁴⁷ Selden was a friend of William Bedwell and something of an Arabist himself. He practiced law in the Temple and amassed a vast scholarly library. By his will he bequeathed to the Bodleian his Greek manuscripts, those of his Talmudic and Rabbinical printed books not already in the Library, and his non-medical oriental manuscripts (the medical manuscripts being destined for the College of Physicians). The total number of Selden's manuscripts is three hundred and fifty-eight, divided equally between oriental and Greek. Among the oriental are one hundred and seventeen Arabic and forty-two in Persian and Turkish. Besides Qur'ānic commentary,⁴⁸ *ḥadīth* (al-Bukhārī⁴⁹), lexicography (al-Jawharī⁵⁰ and al-Firūzābādī⁵¹), and poetry (al-Tha'ālibī⁵²), the areas most strongly represented are history, mathematics and astronomy. There is a copy of part of Eutychius,⁵³ a ten volume set of al-Ṣafadī's biographical dictionary⁵⁴ and a volume containing Ibn al-Shiḥnah and pseudo-al-Mas'ūdī, *Akhbār al-zamān*.⁵⁵ Mathematics is represented, among others, by Euclid, Apollonius and Naṣīr al-Dīn al-Ṭūsī,⁵⁶ astronomy by al-Farghānī,⁵⁷ Ibn al-Haytham⁵⁸ and Ibn al-Shāṭir.⁵⁹ A number of Selden's manuscripts contain a note on provenance written by Selden

himself, from which we learn that a volume of al-Firūzābādī's *al-Qāmūs* was given by Sir Kenelm Digby⁶⁰ and that a recension of Tāj al-Dīn al-Subkī's *Ṭabaqāt al-Shāfi'iyah* was the gift of John Wandesford, consul of the English merchants at Aleppo, 1 May 1633.⁶¹

It was some twenty years before the next important collection, the Greaves collection, was acquired by the Library, but first we might briefly notice the arrival of an interesting single item in or before 1672 when Dr. Thomas Marshall of Lincoln College presented a manuscript containing 'Abd al-Malik al-Shirāzī's version of the *Conics* of Apollonius of Perga.⁶² The manuscript had formerly belonged to Christian Ravius who acquired it in Constantinople, where he assembled a collection of several hundred manuscripts. Ravius regarded it as the jewel of his collection and when he brought it to Europe in 1641 it aroused considerable excitement, for it was known that the Arabic translation of the *Conics* preserved books 5-7 which are lost in the original Greek. Golius in Leiden had the work transcribed for his own use,⁶³ John Greaves was keen to consult it and Claude Hardy, the French mathematician, was eager to buy or borrow it. The manuscript, however, went missing en route from Ravius (now in Sweden) to Hardy and eventually found its way to the Amsterdam bookseller Ratelband where it was purchased by Dr. Marshall.⁶⁴

The Greaves collection was bought by the Library in 1678 and should have comprised sixty-five manuscripts and printed books. Some of these were not received, and as currently constituted the collection contains twenty-one Arabic manuscripts, seventeen Persian and Turkish manuscripts and fourteen non-Oriental items. It was purchased on the death of Thomas Greaves but the Oriental component derives, doubtless almost entirely, from his brother John, who pre-deceased him in 1652.⁶⁵ It was Thomas Greaves who became deputy Professor of Arabic in 1637 during Pococke's absence in the Near East. John Greaves was Professor of Geometry at Gresham College and later, 1643-8, held the chair of Savilian Professor of Astronomy at Oxford. He was a friend of Edward Pococke and together the two had set out for Constantinople in 1637. In addition to pursuing his antiquarian enquiries and astronomical observations, Greaves was eager to acquire Arabic and Persian manuscripts on which, 'he spared no cost in the purchase of them'.⁶⁶ After spending a year in Constantinople he set off for Alexandria but was disappointed in his attempts to secure manuscripts in Egypt, concluding that anything of value must have been removed from that country to the Ottoman capital. Greaves turned to Pococke for assistance and Twells lists his desiderata. These included Ptolemy's *Geography*, Abū al-Fidā's *Taqwīm al-buldān*, al-Battānī, Ulugh Beg, the Qur'ān and commentaries, Ibn Sīnā 'on the soul', several works in Persian, and anything Pococke thought worthwhile relating

to history, philosophy, 'physic', chemistry, algebra and mathematics, especially Greek mathematicians not extant, or only imperfectly so, in Greek and Latin.⁶⁷ Some of the manuscripts that Pococke collected for Greaves may have remained in Pococke's possession.⁶⁸

Noteworthy among the Greaves Arabic manuscripts are a copy of Abū al-Fidā's *Taqwīm al-buldān*,⁶⁹ a fine North African copy of vol.1 of al-Idrīsī,⁷⁰ a valuable manuscript of al-Jazarī (on automata),⁷¹ and astronomical and medical works. The size of the collection is comparatively small, considering the effort and expense that John Greaves is reported to have invested but this might be accounted for by the fact that he was also collecting manuscripts for Laud. In addition Greaves lost at least one Arabic manuscript when his study at Gresham College was ransacked (see below), and he lost books and manuscripts when he was ejected from the Chair of Astronomy at Oxford by the Parliamentary visitors in 1648.⁷² Twells informs us that Greaves was robbed of an Arabic manuscript of Euclid on one of his journeys from Cairo to Alexandria.⁷³ Another manuscript, which suffered a similar fate, but this time in London, was an illustrated copy of Abū Ma'shar's *al-Mudkhal al-kabīr* which Pococke had brought back for him from the East. The circumstances are related by Pococke in a letter to John Selden dated Oxford, 11 February 1652/3.

Most worthily Honoured Sr. I humbly thank you that you are pleased to take notice of my request to you. As concerning the books you mention, I have not my selfe either of them, nor know where they are to be found. I conceive there was once one of AlBumasar in Mr. Greaves his hands: which I brought home for him as a token from a Merchant. It had been a very princely Coppye, of a very fair hand and pictures fairly drawn, but was much worn with use; for which reason he had not so great esteem of it as (I confess) I had. But when his Study at Gresham College was ransaked, that book miscarried, being as I suppose pull'd in pieces: for at a house in London, whither I was once carried to see some Orientall rarities, (as they call'd them) I saw two or three leaves of that book. In the Vrsity Library there is of his *Kitāb Tahāwil sinī al-mawālīd* but that is not his *Introductorium magnum*.⁷⁴

Besides the Greaves collection, the Library also received in 1678 the first of three small donations from Robert Huntington, of whom more will be said later. The two other donations were in 1680 and 1683. The Huntington 'donati' comprise thirty-five manuscripts of which twelve are Arabic, thirteen Hebrew, nine Persian and Turkish and one Syriac.⁷⁵ Of the Arabic manuscripts one is of Christian content,⁷⁶ three are medical (al-Majūsī,⁷⁷ Ibn al-Nafīs,⁷⁸ Ibn Buṭlān⁷⁹ and others) whilst law, astronomy, poetry and *ḥadīth* are also represented.

During the rest of the decade the intake of Arabic manuscripts was small. Two grammatical manuscripts were given in 1684 by Joseph Taylor of St

John's College,⁸⁰ and a fine copy was received, provenance and exact date of acquisition unknown, of Euclid's *Elements* in the version of Ishāq b. Ḥunayn, revised by Thābit b. Qurrah.⁸¹ The bequest of Thomas Marshall was received in 1689-90,⁸² but although nineteen Arabic manuscripts figure among the oriental items, they are outnumbered by Hebrew, twenty-one, and Coptic (or bilingual Coptic-Arabic), twenty-five. Of the Arabic three are Christian and two are Samaritan.

A landmark was reached in the year 1692 when the Bodleian purchased for the sum of £800 the major collection of Edward Pococke who had died the year before.⁸³ The collection comprises over four hundred volumes,⁸⁴ of which Arabic accounts for some two hundred and seventy (six of which are Christian Arabic), with Hebrew over one hundred, the remainder being divided among Persian and Turkish, fourteen, Syriac, twelve, and Ethiopic, Armenian and Coptic. Pococke, the first incumbent of the Laudian Chair of Arabic, had spent five years (1630-1635) as chaplain to the Levant Company at Aleppo. Twells suggests that he resolved to emulate the Dutch scholar Jacobus Golius who came to Aleppo in 1625 on an extended tour and collected manuscripts both for himself and for Leiden University Library.⁸⁵ Like Golius, Pococke availed himself of the services of a certain al-Darwish Aḥmad who acted not only as an agent in obtaining manuscripts but also undertook to copy those that were not available for purchase.⁸⁶ Pococke returned from Aleppo in 1635 and gave his inaugural lecture on 10 August 1636, but within a year, encouraged by Laud, he had set off again for the Near East, this time to Constantinople, where he stayed for three years. He continued to collect manuscripts, not confining his attention to Constantinople, but also approaching old friends in Aleppo for assistance.⁸⁷ In addition the brother of the Patriarch of Antioch, one Thaljah, was 'very diligent in transcribing both Syriac and Arabic books'.⁸⁸ Two Pococke manuscripts in his hand, both by Christian writers, are a copy of Eutychius and the *Taqwīm al-ṣiḥḥah* of Ibn Buṭlān.⁸⁹ With his profound knowledge of Arabic and other Near Eastern languages, Pococke brought a great professionalism to the collecting of manuscripts. Pusey, in the preface to Nicoll's catalogue of Arabic manuscripts recounts the various stratagems used by vendors of manuscripts to mislead the innocent buyer: covering over titles with pieces of paper, obliterating them with ink or scraping them away with a knife, obscuring or slightly altering names, and changing volume numbers. In Pusey's judgement, Pococke alone among the collectors of oriental manuscripts was not taken in by such deceptions.⁹⁰

The Pococke collection is particularly strong in history,⁹¹ biography and philology, with poetry, belles-lettres and philosophy represented in smaller degrees. There is little mathematics and astronomy but a sizeable number of medical works. Among the historians and biographers we find al-Ṭabarī⁹²

Eutychius,⁹³ al-ʿUtbi,⁹⁴ Ibn al-Jawzī,⁹⁵ Ibn al-Athīr,⁹⁶ Sibṭ b. al-Jawzī,⁹⁷ Ibn Abī Usaybiʿah,⁹⁸ al-Makīn,⁹⁹ Ibn Khallikān,¹⁰⁰ Bar Hebraeus,¹⁰¹ al-Yunaynī,¹⁰² Abū al-Fidāʾ,¹⁰³ Ibn Duqmāq,¹⁰⁴ al-Maqrīzī,¹⁰⁵ Ibn Taghrībīrdī,¹⁰⁶ al-Suyūṭī¹⁰⁷ and al-Jannābī.¹⁰⁸ In the field of philology Pococke possessed the major dictionaries: al-Jawharī's *al-Ṣihāḥ*¹⁰⁹ and al-Fīrūzābādī's *al-Qāmūs*,¹¹⁰ the grammatical works of Ibn Durayd,¹¹¹ al-Jurjānī, al-Muṭarrizī and Ibn al-Ḥājjib,¹¹² Ibn Mālik,¹¹³ and Ibn Ājurrūm.¹¹⁴ Poetry is represented by the *Muʿallaqāt*,¹¹⁵ Abū Tammām,¹¹⁶ al-Mutanabbī,¹¹⁷ al-Maʿarrī,¹¹⁸ al-Tughrāʾī¹¹⁹ and Ibn al-Fāriḍ,¹²⁰ belles-lettres by an illustrated Mamluke copy of *Kalilah wa-Dimnah*¹²¹ and the *Maqāmāt* of al-Ḥarīrī.¹²² Pococke's philosophical manuscripts include the *Ikhwān al-Ṣafāʾ*,¹²³ Ibn Sīnā's *al-Shifāʾ*,¹²⁴ the rare treatises of Ibn Bājjah¹²⁵ and Ibn Ṭufayl's *Hayy b. Yaqzān*.¹²⁶ To these we might also add as noteworthy the copy of al-Idrīsī with its attractive world map,¹²⁷ and al-Maydānī's collection of proverbs ('Chiliads').¹²⁸

In the same year as the Pococke purchase, thirty-nine Persian and Arabic manuscripts belonging to Thomas Hyde were acquired for £50.¹²⁹ Hyde had come to Oxford from Cambridge as reader in Hebrew in 1658. He went on to hold the posts of Laudian Professor of Arabic, Regius Professor of Hebrew and, from 1665 until 1701, the post of Bodley's Librarian. On his death in 1703, eleven more of his manuscripts entered the Library.¹³⁰ But the total number of Arabic is small—twelve, of which the most outstanding is that containing Dioscorides and Ibn Juljul.¹³¹

It was also during the librarianship of Thomas Hyde that another major collection of Arabic manuscripts was received, that of Robert Huntington, in 1692. The whole collection amounted to over six hundred volumes and was purchased for a record sum of just over £1,000.¹³² Huntington was educated at Merton College to which he was elected a fellow in about 1663. In 1670, following Pococke's example, he took up the post of chaplain to the Levant Company in Aleppo and he remained in the Near East for over ten years. During this time he visited Palestine, Egypt and Cyprus, assiduously collecting manuscripts not only for himself but also for Thomas Marshall, Narcissus Marsh, and Edward Pococke.¹³³ We have seen that Huntington had earlier presented a selection of his manuscripts to the Library. He also gave fourteen manuscripts to his Oxford college.

Huntington had an interest in the Eastern Churches and maintained correspondence with a number of Eastern churchmen.¹³⁴ His interest in Eastern Christianity is evident from an analysis of his collection. Of some 320 Arabic manuscripts fifty are of Christian content. Syriac is represented by a figure of thirty, Coptic by twenty-nine, and the collection also contains over two hundred Hebrew manuscripts. There are many rare and early manuscripts

in the collection, including the earliest dated Arabic manuscript on paper in the Bodleian, a copy of vol. 2 of *Dīwān al-adab* by Ishāq b. Ibrāhīm al-Fārābī, dated 373 or possibly 363 A.H.¹³⁵

History is among the subjects well represented in the Huntington collection with works by al-Mas'ūdī,¹³⁶ Ibn al-Qalānisi,¹³⁷ 'Imād al-Dīn al-Iṣfahānī,¹³⁸ al-Makīn,¹³⁹ Ibn Khallikān,¹⁴⁰ Abū al-Fidā',¹⁴¹ Ibn Kathīr,¹⁴² al-Maqrīzī¹⁴³ and Ibn Ḥajar al-'Asqalānī.¹⁴⁴ Another area of strength is medicine, represented by Galen and Ḥunayn b. Ishāq,¹⁴⁵ al-Majūsī,¹⁴⁶ Ibn al-Jazzār,¹⁴⁷ al-Zahrāwī,¹⁴⁸ Ibn Sīnā,¹⁴⁹ Ibn Zuhr,¹⁵⁰ Maimonides,¹⁵¹ Ibn al-Bayṭār¹⁵² and Ibn al-Nafīs.¹⁵³ Other subjects well covered are geography (Ibn Khurdādhbih,¹⁵⁴ Ibn Ḥawqal,¹⁵⁵ Abū al-Fidā'¹⁵⁶), lexicography (fourteen volumes of al-Jawhārī's *al-Ṣiḥāh*,¹⁵⁷ al-Fīrūzābādī's *al-Qāmūs*¹⁵⁸), law, astronomy and mathematics (including al-Khwārizmī's *Algebra*¹⁵⁹). There are also works in more unusual fields such as cookery,¹⁶⁰ mineralogy¹⁶¹ and the arts of warfare.¹⁶² In the last category is the fine illustrated manuscript of al-Ṭarsūsī's treatise on weaponry commissioned by Saladin for his own library.¹⁶³

In 1698, a year after his death, the Library bought for £200 the manuscript collection of Edward Bernard, Savilian Professor of Astronomy at Oxford, 1673-91.¹⁶⁴ The Arabic manuscripts in the collection amount to fewer than twenty, mostly astronomical. The most notable is a copy of al-Bīrūnī's *al-Qānūn al-Mas'ūdī*, dated 475 A.H. and collated with the autograph.¹⁶⁵ Among the manuscripts in Bernard's own hand are Arabic grammatical notes and geometrical problems drawn from Arabic sources, including excerpts from Apollonius' *Conics*.¹⁶⁶ Bernard, an outstanding scholar, became editor-in-chief of the union catalogue of manuscripts in English and Irish libraries¹⁶⁷ which was published in 1698. The catalogue contains entries for oriental as well as western manuscripts beginning with the Bodleian collections, and is prefaced with a life of Sir Thomas Bodley and a history of the Library. At the end of the catalogue the collection of Archbishop Narcissus Marsh is listed which at the time was still in Dublin.¹⁶⁸ Marsh's collection is the last major oriental collection we shall consider.

Narcissus Marsh matriculated at Magdalen Hall, Oxford, and went on to become a fellow of Exeter college in 1658. He was appointed Provost of Trinity College, Dublin in 1678, Archbishop of Dublin in 1694 and later Archbishop of Armagh. He died in 1713 and all his oriental manuscripts, together with a few Greek and other volumes, were bequeathed to the Bodleian, where they arrived in 1714. Unlike Pococke and Huntington, Marsh spent no time in the Near East. The sources of his collection are various. Some of his manuscripts were supplied by Robert Huntington,¹⁶⁹ others belonged formerly to Dudley Loftus.¹⁷⁰ But Marsh's greatest success as a collector came

when, through the services of Edward Bernard, he secured almost 70 per cent (two hundred and seventy-four out of four hundred and seven items) of the oriental books and manuscripts of the Dutch scholar Jacobus Golius at the Leiden sale of 1696.¹⁷¹

The Marsh collection contains well over five hundred Arabic manuscripts of which some nineteen only are of Christian orientation. Its addition to the Bodleian's holdings consolidated and further enriched the Library's already considerable resources. Areas of strength are medicine, history, poetry, law, grammar, astronomy and mathematics. There are also works on music,¹⁷² astrology,¹⁷³ alchemy and the occult.¹⁷⁴ Marsh's main interest was mathematics and he must have been especially gratified to secure the magnificent copy of Apollonius' *Conics* which Golius had acquired in Aleppo in 1627,¹⁷⁵ and which was later used by Edmund Halley for his edition of the *Conics*, printed at Oxford in 1710.¹⁷⁶ Authors and works not previously found in the Bodleian are Galen's *Anatomy* in fifteen books,¹⁷⁷ historical works by Ibn Miskawayh,¹⁷⁸ Abū Shāmah,¹⁷⁹ Ibn Shaddād¹⁸⁰ and Ibn Abī Zar',¹⁸¹ and in poetry al-Farazdaq,¹⁸² Abū Nuwās¹⁸³ and al-Hillī.¹⁸⁴ The collection contains manuscripts notable for their antiquity and beauty such as Qur'ān fragments in Kufic script on vellum,¹⁸⁵ the illustrated Mamluke *Maqāmāt* of al-Ḥarīrī,¹⁸⁶ al-Šūfī's *Book of the Fixed Stars* dated 400 A.H.,¹⁸⁷ and a fine calligraphic copy of Ibn Miskawayh's, *Jāwīdān Khirad* dated 439 A.H.¹⁸⁸ The two last mentioned belonged to Golius. Other Golius items of interest are two manuscripts formerly in the possession of the celebrated sixteenth-century Ottoman astronomer Taqī al-Dīn b. Ma'rūf,¹⁸⁹ and the 'Erpenius' manuscript of al-Makīn.¹⁹⁰ This manuscript takes us back beyond Golius to the early years of the seventeenth century. It originally belonged to the Palatinate Library in Heidelberg from where it was borrowed, probably in 1613, by the great Dutch scholar Erpenius. When the Palatinate Library was transferred to the Vatican in 1623, Erpenius did not return it. On his death in 1624 it passed to his compatriot and 'successor' Jacobus Golius.

The 'Marsh'-Golius manuscripts were not in fact the first manuscripts of Golius to enter the Library and we complete this survey by mentioning five others which were received before the Marsh bequest. They were given in 1700 by Moses Amyrault (Amyrault), a refugee from France who was awarded a degree at Oxford in that year.¹⁹¹ Of the five, all of which are traceable in the 1696 Golius sale catalogue,¹⁹² one is Turkish.¹⁹³ The others comprise two copies of vol.5 of Ibn Khaldūn,¹⁹⁴ vol.3 of Ibn Ḥayyān's *al-Muqtabis fī ta'rikh al-Andalus*,¹⁹⁵ and a manuscript of alchemical content.¹⁹⁶

There was some irony in the Bodleian's acquisition via the Marsh bequest of the greater part of Golius' private collection. More than forty years earlier,

in 1668, when it first came on the market, Pococke had been dismissive of the Golius collection and critical of the high price solicited. Edward Bernard had sent a copy of the 1668 catalogue¹⁹⁷ to Pococke for his consideration. Pococke's response is contained in a letter to Bernard at Leiden, dated 8 February 1668.

Worthy Sir, Yo^r letters were very wellcōe to me especially because they brought the good newes of your being well in Holland. The printed copy of Golius's MS^{ps}. I have perused, very faulty and defectively put out. that which I have conjectured from it, is that the best and noblest of his bookes are taken out, for nobler Autho^r then any of those he useth to cite. and if I be not deceived I have formerly seene, at least one booke, belonging to him which I finde not here. and without the best Lexicons he could not be, wheras here is neither Kamus nor Gieuhery nor any other of the best note. besides you may observe that the best authors in y^e Catalogue, are but imperfect parts of greater workes, as pag.2 Abul Feda without tables, and in the next author, which I should esteeme one of the best, the first vol: is wanting, and I know not whither more after y^e 5th vol: and p.5 of Avicens Canon there is only lib. 5^{ms} p.7 of Razi only lib. nonus, of Zahrawi only lib. 10^{ms} and p.11. the first booke is only liber 3^{us} of Hist. Dahabi . . . , so y^t I cannot think the bookes worth nigh y^t value which is set upon y^e, nor that they are Golius's complete library of MSS. but this in private to yo^r selfe that we may not seeme to disparage the Catalogue or bookes

. . .¹⁹⁸

We may suppose that once Pococke had expressed himself in such unequivocal terms no further thought was given at Oxford to the purchase of the Golius collection for the University Library.

NOTES

The following abbreviations have been used in the notes:

- Ethé *Catalogue of the Persian, Turkish, Hindûstânî, and Pushtû manuscripts in the Bodleian Library*, begun by Ed. Sachau, continued, completed and edited by Hermann Ethé, 2 pts. (Oxford, 1889-1930).
- NAC 'Codices Christiani Sermone et Literis Arabicis Expressi' in *Catalogi Codicum Manuscriptorum Orientalium Bibliothecae Bodleianae Pars Secunda Arabicos Complectens*, confecit Alexander Nicoll (Oxford, 1835), pp.10-59.
- NAM 'Codices Arabici Mohammedani' in *idem*, pp. 60-407 (sic) & 433-9.
- Neubauer *Catalogue of the Hebrew Manuscripts in the Bodleian Library and in the College Libraries of Oxford*, compiled by Ad. Neubauer (Oxford 1886).
- SC *A Summary Catalogue of Western Manuscripts in the Bodleian Library at Oxford*, 7 vols. (Oxford, 1895-1953; reprinted: Munich,

1980).

Twells *The Theological Works of the Learned Dr. Pocock, to which is prefixed, An account of his Life and Writings*, by Leonard Twells, 2 vols. (London, 1740), I, pp.1-84.

UAC '*Codices Christiani Litera et Sermone Arabicis Expressi*' in *Bibliothecae Bodleianae Codicum Manuscriptorum Orientalium Catalogus*, Pars Prima a Joanne Uri confectus (Oxford, 1787), pp. [29]-46 (second pagination).

UAM '*Codices Manuscripti Arabici*' in *idem*, pp. [47]-268 (second pagination).

UT '*Codices Turcici*' in *idem*, pp. 302-17.

¹ On the background to the study of Arabic see P. M. Holt, 'The Study of Arabic Historians in Seventeenth-Century England' in P. M. Holt, *Studies in the History of the Near East* (London, 1973), pp. 27-32; and A. Hamilton, *William Bedwell the Arabist, 1563-1632* (Leiden, 1985), chaps 1 & 4.

² MS.Bodl.Or.322 [SC 2868; NAM 6]. Catalogued as '*Alcoran Arabicè in F^o. T. James, Catalogus Librorum Bibliothecae Publicae quam ... Thomas Bodleius... in Academia Oxoniensi nuper instituit* (Oxford, 1605), p. 11 (reprinted: Oxford, 1986). For a conspectus of manuscript accessions in the seventeenth century, both oriental and (chiefly) western, see *A Summary Catalogue of Western Manuscripts in the Bodleian Library at Oxford*, vol. 1, ed. by R. W. Hunt (Oxford, 1953; Reprinted: Munich, 1980), pp. 76-122.

³ *Letters of Sir Thomas Bodley to Thomas James*, ed. with an introduction by G. W. Wheeler (Oxford, 1926), p. 88.

⁴ On Bodley, see the article in *Encyclopaedia Judaica*, vol. 4 (Jerusalem, 1971), col. 1164.

⁵ MS.Bodl.Or.519 [SC 2914; NAM 364]. Commentaries on *al-Risālah al-Shamsiyah fi al-qawā'id al-mantiqiyah* of Najm al-Din 'Alī al-Kātibi.

⁶ MS.Thurston 36 [SC 4021; UAM 70]. This is the '*Alcorā in 16^o, Arabicè minutiss. lit.*' in T. James, *Catalogus*, p.11.

⁷ MS.Bodl.Or.95 [SC 2860; UAM 36].

⁸ MS.Bodl.Or.230 [SC 2996; NAC 12].

⁹ *Letters of Sir Thomas Bodley to the University of Oxford, 1598-1611*, ed. by G. W. Wheeler (Oxford, 1927), p. 21.

¹⁰ (1) MS.Bodl.Or.34 [SC 3540; UAC 19]. Psalms and canticles. The entry in the '*MS.Bodl.Or. Handlist*' expresses uncertainty as to whether this manuscript was given by Paul Pindar in 1611; (2) MS.Bodl.Or. 251 [SC 3066; NAC 6]. *The Apocalypse of Ezra* and other works.

¹¹ MS.Bodl.Or.571 [SC 2923; NAC 37].

¹² MS.Bodl.Or.323 [SC 2945; UAM 453].

¹³ MS.Bodl.Or.483 [SC 2916; NAM 225].

¹⁴ MS.Bodl.Or.513 [SC 2907; NAM 181]. The two other medical manuscripts are: (1) MS.Bodl.Or.231 [SC 2997; NAM 191]. A commentary on the *Prognostica* of Hippocrates by Dakhwār al-Dimashqī. The '*MS.Bodl.Or. Handlist*' has 'Apparently given by Paul Pindar 1611'; (2) MS.Bodl.Or.491 [SC 2917; NAM 182]. A pharmacopoeia of Jalāl al-Dīn Ibn al-Khazzān, and other matter.

¹⁵ Matthias Pasor, *Oratio pro Linguae Arabicae Professione, Publice ad Academicos Habita in Schola Theologica Universitatis Oxoniensis*, xxv Octob. 1626 (Oxford, 1627), p. B7v: '... habetis ... nec non opera B Ephremi & Nazri de insomnijs MSS. cum quatuor exemplaribus pulcherrimis Alcorani Mahomedici alijsque antiquitatibus suo tempore eruendis.' On Matthias Pasor, see Hamilton, *William Bedwell*, pp. 49, 88-90.

¹⁶ The fourth Qur'ān would be MS.Bodl.Or.362 [SC 2146; NAM 21], given by Thomas Gataker in 1621. The remaining Arabic manuscripts, so far unmentioned, but in the Library in 1626 were: (1) MS.Bodl.Or.163 [SC 3549; UAM 3]. Eight leaves from a Qur'ān, apparently acquired 1613-15; (2) MS.Thurston 2 [SC 3969; UAM 532]. Part of book 3 of Ibn Sinā's *al-Qānūn*, probably acquired between 1613 and 1615; (3) MS.Thurston 20 [SC 3987; UAM 1252]. Part of the *Diwān* of al-Mutanabbi, probably acquired between 1613 and 1615; (4) MS.Bodl.Or.795 [SC 2972; NAM 398]. A certificate of proficiency in Qur'ān recitation, probably acquired c.1611-14.; (5) MS.Bodl.Or.226 [SC 2147; Ethé 2263]. Prayers in Arabic with Turkish commentaries, given by Thomas Gataker in 1621.

¹⁷ MS.Bodl.Or.534 [SC 3042; NAM 42].

¹⁸ MS. Roe 26 [SC 272; NAC 36].

¹⁹ I. Philip, *The Bodleian Library in the Seventeenth and Eighteenth Centuries* (Oxford, 1983), p. 38.

²⁰ SC 300-1601.

²¹ H. R. Trevor-Roper, *Archbishop Laud, 1573-1645*, 2nd edn (London, 1965), p. 274.

²² Twells, p. 7.

²³ Twells, p. 7.

²⁴ MS. Laud Or.323, fol.1r [SC 476; Ethé 5]. Bal'amī's Persian translation of al-Ṭabari's *Ta'rikh*. 'Liber Johannis Greaves Socij Coll: Mertonensis, quem A^oD., 1638 Constantinopoli emit, et Reverendissimo Archiepiscopo Can[t]uar, cum multis alijs Codicibus MSS. Arabicis, Persicis, Graecis, et Latinis, dono dedit'. This is doubtless the manuscript referred to by Twells, p.20: '... five Persick, one of which, written in very large Folio, contained the History of the World ...'

²⁵ For the history of a Laudian manuscript of the Qur'ān, formerly belonging to Jacobus Christmann, Professor of Arabic at Heidelberg University, see Robert Jones, 'Piracy, War, and the Acquisition of Arabic manuscripts in Renaissance Europe' in *Manuscripts of the Middle East*, II (1987), pp.100-3. The manuscript is MS.Laud Or.246 [SC 459; UAM 1].

²⁶ (1) MS.Laud Or.240 [SC 609; UAM 1056]; (2) MS.Laud Or.261 [SC 454; UAM 1051]; (3) MS.Laud Or.239 [SC 616; UAM 1052].

²⁷ MS.Laud Or.139 [SC 439; UAM 530]. Galen's commentary on the *Prognostica* of Hippocrates.

²⁸ MS.Laud Or.289 [SC 573; UAM 607]. UAM identifies this wrongly, it is vol.1 of the *Kitāb al-Fākhir*, not the *al-Hāwī*.

²⁹ MS.Laud Or.5 [SC 398; UAM 527]. Ibn Sinā's *al-Manẓūmah fī al-ṭibb* and the commentary of Ibn Rushd.

³⁰ MS.Laud Or.235 [SC 627; UAM 526]. *Jāmi' mufradāt al-adwiyah wa-al-aghddhiyah*.

³¹ MS.Laud Or.278 [SC 596; UAM 873]. *Minhāj al-ṭālib li-ta'dīl al-kawākib* and another work.

³² MS.Laud Or.221 [SC 349; UAM 974]. *al-Zij al-jadid* ?

³³ MS.Laud Or.90 [SC 574; UAM 335]. *Majma' al-amthāl*.

³⁴ MS.Laud Or.210, fol. 82v-101v [SC 387; UAM 341 (2)]. The manuscript lacks a leaf or two at the end.

³⁵ On the Arabic historical manuscripts in the Bodleian Library in the seventeenth century, see Holt, *Studies*, pp. 32-3.

³⁶ The Bodleian manuscripts of al-Ṭabari were not conclusively identified as such until 1862. See J. de Goeje, 'Literarische Notiz', *Zeitschrift der deutschen morgenländischen Gesellschaft* XVI (1862), 759-62. The manuscripts are: (1) MS.Laud Or.265 [UAM 650]; (2) MS.Pococke 354 [UAM 676]; (3) MS.Huntington 198, fol.1v-8v only [UAM 711 (1)]; (4) MS.Marsh 124 [UAM 722].

³⁷ (1) MS.Laud Or.287 [SC 594; UAM 662]. *Nuṣrat al-fiṭrah wa-ʿuṣrat al-qāṭrah*;

- (2) MS.Laud Or.297 [SC 567; UAM 775]. *al-Fath al-Qussī fi al-fath al-Qudsi*.
³⁸ MS.Laud Or 161 [SC 423; UAM 715].
³⁹ (1) MS.Laud Or.91 [SC 403; UAM 825]; (2) MS.Laud Or.131 [SC 428; UAM 714]; (3) MS.Laud Or.169 [SC 411; UAM 690].
⁴⁰ (1) MS.Laud Or.244 [SC 442; UAM 659]; (2) MS.Laud Or.279 [SC 599; UAM 656]; (3) MS.Laud Or.286 [SC 605; UAM 652]; (4) MS.Laud Or.304 [SC 611; UAM 649]; (5) MS.Laud Or.305 [SC 593; UAM 654].
⁴¹ MS.Laud Or.4 [SC 397; UAM 685]. *al-Wāfi bi-al-Wafayāt*, vol. 24.
⁴² MS.Laud Or.163 [SC 417; UAM 655]. *Futūḥ al-Shām*.
⁴³ SC vol.2, pt.1, pp.76-7 contains a brief list of the Digby oriental manuscripts compiled by E. W. B. Nicholson (Bodley's Librarian, 1882-1912).
⁴⁴ MSS.Bodl.Or.798 & 799 [SC 477 & 478; UAM 1048 & 1049].
⁴⁵ MS.Bodl.Or.800 [SC 625; UAM 1059].
⁴⁶ MS.Bodl.Or.285 [SC 2884; NAM 38].
⁴⁷ SC 3134-3490.
⁴⁸ (1) MS.Arch.Seld.A.14 [UAM 4]. *al-Bayḍāwī's Anwār al-tanzil*; (2) MS.Arch.Seld.A.15 [UAM 5]. *Fakhr al-Din al-Rāzī's Mafātiḥ al-ghayb*.
⁴⁹ (1) MS.Arch.Seld.A.37 [UAM 99]; (2) MS.Arch.Seld.A.58 [UAM 101].
⁵⁰ MS.Arch.Seld.A.9 [UAM 1066].
⁵¹ (1) MS.Arch.Seld.A.8 [UAM 1078 (misprinted 1068)]; (2) MS.Arch.Seld.A.41 [UAM 1085]; (3) MS.Selden superius 94 [UAM 1147].
⁵² MS.Selden superius 16-19 [UAM 808, 806, 807, 805]. *Yatimat al-dahr*, vol.1-4.
⁵³ MS.Arch.Seld.A.74 [NAC 46].
⁵⁴ MSS.Arch.Seld.A.20-29 [UAM 663-5, 668-70, 673-4, 677-8].
⁵⁵ MS.Arch.Seld.A.19 [UAM 666].
⁵⁶ (1) MS.Arch.Seld.A.32, fol. lv-80r [UAM 877(1)]; (2) MS.Arch.Seld.A.45 [UAM 875]; (3) MS.Arch.Seld.A.46 [UAM 895].
⁵⁷ MS.Arch.Seld.A.11, fol. 2v-37v [UAM 879(1)]. *Kitāb Jawāmi' 'ilm al-nujūm*.
⁵⁸ MS.Arch.Seld.A.32, fol. 81v-184v [UAM 877(2-9)].
⁵⁹ (1) MS.Arch.Seld.A.30 [UAM 876]. *al-Zij al-jadid*; (2) MS.Selden superius 61 [UAM 1030]. It contains three works of Ibn al-Shāṭir.
⁶⁰ MS.Arch.Seld.A.8. See note 51,1.
⁶¹ MS.Arch.Seld.A.38 [UAM 667].
⁶² MS.Thurston 3, fol. lv-52r [SC 3970; UAM 913(1)].
⁶³ J. J. Witkam, *Jacobus Golius (1596-1667) en zijn Handschriften* (Leiden, 1980), pp. 57-58. Now in the Bodleian Library, MS.Marsh 720, fol.1r-57v [UAM 987], in the hand of Nicolaus Petri, for whom see W. M. C. Juynboll, *Zeventiende-eeuwsche Beoefenaars van het Arabisch in Nederland* (Utrecht, 1931), pp.160-1.
⁶⁴ K. M. P., 'The Wanderings of Apollonius' in *The Bodleian Quarterly Record*, III (1921), 152-3.
⁶⁵ SC 3773-837. Although the SC states that the Greaves collection was purchased, MS.Greaves 42 appears to have been presented by Thomas Greaves. A note written on the flyleaf reads 'Liber Bibliothecae Bodleianae ex dono Thomae Greaves. S.T.D.'
⁶⁶ Twells, p.15.
⁶⁷ Twells, p.16.
⁶⁸ See Greaves' letter of 23 December 1636 to Pococke, published in John Ward, *The Lives of the Professors of Gresham College* . . . (London, 1740), pp.137-8: 'Worthy Friend, You oblige me too far in the overture of those choice bookes, which you have brought with you; rather let the propriety be yours, and onely the use of some of them mine.' My thanks to Mr. F. R. Maddison of the Museum of the History of Science, Oxford for this reference.
⁶⁹ MS. Greaves 2 [UAM 903].
⁷⁰ MS. Greaves 42 [UAM 884].
⁷¹ MS. Greaves 27 [UAM 886].

⁷² *Dictionary of National Biography*, 63 vols. (London, 1885-1900), XXIII, p.38 col.b.

⁷³ Twells, p.17.

⁷⁴ Preserved in MS.Smith 21, p. 29. [SC 15628].

⁷⁵ SC 3738-72.

⁷⁶ MS.Huntington donat.29 [UAC 69]. A collection of Canons of the Coptic Church.

⁷⁷ MS.Huntington donat.31, fol. 3v-118r [UAM 529(1)]. Books 9 and 10 of Part 2 of the *Kāmil al-ṣinā'ah al-tibbiyah*.

⁷⁸ MS.Huntington donat.9 [UAM 625]. The abridgment of Ibn Sinā's *al-Qānūn*.

⁷⁹ MS.Huntington donat.34 [UAM 663]. *Taqwīm al-ṣiḥḥah*.

⁸⁰ (1) MS.Thurston 29 [SC 4010; UAM 1180]. An anon. commentary on the *al-Kāfiyah* of Ibn al-Ḥājib.

2) MS.Thurston 33 [SC 4014; UAM 1179]. Containing Ibn al-Ḥājib's *al-Kāfiyah*, the *Kitāb al-Miṣbāḥ* of al-Muṭarrizi, and the *Kitāb al-'Awāmil al-mi'ah* of al-Jurjānī.

⁸¹ MS.Thurston 11 [SC 3978; UAM 958 & NAM 279].

⁸² SC 5233-327 & 8623-86.

⁸³ For Pococke's life and career, see 'An Oxford Arabist: Edward Pococke (1604-91)', in P. M. Holt, *Studies*, pp. 3-26.

⁸⁴ SC 5328-5747^{mm}

⁸⁵ Twells, p. 7.

⁸⁶ Holt, *Studies*, p. 31-2. Five letters from al-Darwish Aḥmad to Pococke are preserved in MS.Pococke 432, fol. 5-9. They are summarized and part translated by Holt, *Studies*, pp. 42-5. A letter from Golius to al-Darwish Aḥmad and one from al-Darwish Aḥmad to Golius, preserved in Leiden Codex 1228, are printed in M. Th. Houtsma, *Uit de Oostersche Correspondentie van Th. Erpenius, Jac. Golius en Lev. Warner*, (Amsterdam, 1887) pp. 48, 49. Three Pococke manuscripts in the hand of al-Darwish Aḥmad are: (1) MS.Pococke 92 [NAM 373]; (2) MS.Pococke 325 [UAM 1211]; (3) MS.Pococke 89, fol. 3v-61r [UAM 412(1)].

⁸⁷ Twells, p.14.

⁸⁸ Twells, p.14. For Thaljah see Holt, *Studies*, pp. 43 and 49, n.47. The other Eutychius manuscript copied by Thaljah is MS.Arch.Seld.A.74 [NAC 46].

⁸⁹ (1) MS.Pococke 351 [UAC 90]; (2) MS.Pococke 363 [UAM 554].

⁹⁰ A. Nicoll, *Catalogi Codicum Manuscriptorum Orientalium Bibliothecae Bodleianae Pars Secunda Arabicos Complectens* (Oxford, 1835), p. iv.

⁹¹ For Pococke's contribution to historical scholarship see Holt, *Studies*, 33-7.

⁹² See note 36.

⁹³ MS.Pococke 351 [UAC 90].

⁹⁴ MS.Pococke 372 [UAM 675].

⁹⁵ MS.Pococke 255 [UAM 779].

⁹⁶ (1) MS.Pococke 73 [UAM 784]; (2) MS.Pococke 103 [UAM 696]; (3) MS.Pococke 137 [UAM 694]; (4) MS.Pococke 346 [UAM 693].

⁹⁷ (1) MS.Pococke 370 [UAM 679]; (2) MS.Pococke 371 [UAM 682].

⁹⁸ MS.Pococke 356 [UAM 701].

⁹⁹ MS.Pococke 312 [UAM 683].

¹⁰⁰ (1) MSS.Pococke 335, 336 [NAM 117, 118]; (2) MS.Pococke 337 [NAM 116]; (3) MS.Pococke 338 [NAM 119]; (4) MS.Pococke 339 [UAM 692].

¹⁰¹ (1) MS.Pococke 54 [UAC 97]; (2) MS.Pococke 162 [UAC 96].

¹⁰² MS.Pococke 132 [UAM 700].

¹⁰³ (1) MSS. Pococke 303, 305 [UAM 686, 687]; (2) MS.Pococke 304 [UAM 689].

¹⁰⁴ MS.Pococke 352 [UAM 680].

¹⁰⁵ (1) MS.Pococke 293 [UAM 688]; (2) MS.Pococke 361, fol. 20v-61v [UAM 97(2)]. An extract on the history of Damietta 3) MS.Pococke 394 [UAM 671].

¹⁰⁶ MS.Pococke 327 [UAM 691]. *Mawrid al-laṭāfah fī-mant waliya al-salṭanah wa-al-khilāfah*.

- ¹⁰⁷ MS.Pococke 159 [UAM 813]. *Kitāb Ḥusn al-muḥāḍarah*, vol.1.
- ¹⁰⁸ MSS.Pococke 176, 177 [UAM 785, 786].
- ¹⁰⁹ (1) MS.Pococke 308 [UAM 1077 (misprinted 1067)]; (2) MS.Pococke 332 [NAM 202]; (3) MS.Pococke 365 [UAM 1068]; (4) MS.Pococke 367 [UAM 1064]; (5) MS.Pococke 384 [UAM 1098]; (6) MS.Pococke 386 [NAM 201]; (7) MS.Pococke 387 [UAM 1096]; (8) MS.Pococke 388 [UAM 1099]; (9) MS.Pococke 397 [UAM 1092]; (10) MS.Pococke 398 [NAM 200]
- ¹¹⁰ (1) MSS.Pococke 138-141 [UAM 1119-22]; (2) MS.Pococke 358 [UAM 1073 (misprinted 1063)]; (3) MS.Pococke 406 [NAM 353].
- ¹¹¹ MS.Pococke 266, fol.1v-70v [UAM 1257(1)]. *al-Maqṣūrah*, followed by two works of Ibn Mālik.
- ¹¹² MS.Pococke 24 [UAM 1176].
- ¹¹³ MS.Pococke 76 [UAM 1246]. *al-Alfiyah*.
- ¹¹⁴ (1) MS.Pococke 20 [UAM 1174]; (2) MS.Pococke 434 [NAM 216].
- ¹¹⁵ (1) MS.Pococke 33, fol. 24v-127r [UAM 1268(4)]; (2) MS.Pococke 164 [UAM 1219]. A commentary on the 'Seven Mu'allaqāt', by Abū al-'Abbās Aḥmad ibn 'Abd Allāh al-Anṣārī.
- ¹¹⁶ (1) MS.Pococke 163 [UAM 1207]; (2) MS.Pococke 165 [UAM 1218]. The commentary of al-Marzūqī; (3) MS.Pococke 330 [UAM 1199]. The same commentary as (2) above.
- ¹¹⁷ (1) MS.Pococke 33, fol.192v-216r [UAM 1268(8)]. Select poems from the *Diwān*; (2) MS.Pococke 77 [NAM 312]. The commentary of al-Wāḥidī; (3) MS.Pococke 92 [NAM 373]; (4) MS.Pococke 173 [UAM 1231]; (5) MS.Pococke 218 [UAM 1208]. The same commentary as (2) above; (6) MS.Pococke 446 [NAM 325]. A fragment only.
- ¹¹⁸ (1) MS.Pococke 11 [UAM 1293]. *Luzūm mā lam yalzam*; (2) MS.Pococke 88 [UAM 1277]. *Saqṭ al-zand*; (3) MS.Pococke 149 [NAM 329]. *Saqṭ al-zand*, followed by poems from the *Diwān*; (4) MS.Pococke 180 [UAM 1256]. Similar to or the same as (3); (5) MS.Pococke 325 [UAM 1211]. An anonymous commentary on the *Saqṭ al-zand*.
- ¹¹⁹ The famous poem *Lāmiyat al-'Ajam*, which Pococke published: *Lamiato'l Ajam, Carmen Tograi, Poetae Arabis Doctissimi*; unà cum versione Latina & notis, operâ Edvardi Pocockii (Oxford, 1661). (1) MS.Pococke 26, fol. 99r-103v [NAM 334(2)]; (2) MS.Pococke 33, fol.187v-191r [UAM 1268(7)]; (3) MS.Pococke 267 [UAM 1206]. With the commentary of Ṣalāḥ al-Dīn al-Ṣafadī; (4) MS.Pococke 318 [UAM 1203]. Accompanied by the same commentary as (3)
- ¹²⁰ (1) MS.Pococke 81, fol.1v-307r [UAM 1233(1)]. The *Diwān* with the commentary of al-Būrīnī; (2) MS.Pococke 174, fol.1v-50v [UAM 1298(1)].
- ¹²¹ MS.Pococke 400 [UAM 356].
- ¹²² (1) MS.Pococke 171 [UAM 403]. al-Panjdahī's commentary on *maqāmah* 24-50; (2) MS.Pococke 172 [UAM 361] 3) MS.Pococke 197 [UAM 357].
- ¹²³ (1) MS.Pococke 178 [UAM 966 (the second of the two consecutive entries so numbered)]; (2) MS.Pococke 261 [UAM 959]; (3) MS.Pococke 342 [UAM 894].
- ¹²⁴ (1) MSS.Pococke 109-24 [UAM 476, 477, 481, 472, 475, 467, 468, 471, 482, 486, 493, 473 (misprinted 474), 490, 485, 495, 487]. Parts of a fine set originally in twenty-four vols.; (2) MS.Pococke 125 [UAM 435]; (3) MS.Pococke 250 [UAM 436 & 893].
- ¹²⁵ MS.Pococke 206 [UAM 499].
- ¹²⁶ MS.Pococke 263, fol. 23v-69r [UAM 133(2)]. For Pococke's work on *Ḥayy*, see Holt, *Studies*, p.14, and Michael Nahas, 'A Translation of Ḥayy b. Yaqzān by the elder Edward Pococke' *Journal of Arabic Literature*, XVI (1985), 88-90.
- ¹²⁷ MS.Pococke 375 [UAM 887].
- ¹²⁸ (1) MS.Pococke 194 [UAM 311]; (2) MS.Pococke 217 [NAM 96]; (3) MS.Pococke 222 [UAM 312]; (4) MS.Pococke 392 [UAM 313]. With Latin translation by Pococke.

See Twells, pp. 6, 68, 69 and Holt, *Studies*, p. 5.

¹²⁹ SC 6374*-412.

¹³⁰ SC 27798-808.

¹³¹ MS.Hyde 34 [UAM 573].

¹³² SC 5748-6374, and Philip, *The Bodleian Library*, p. 60.

¹³³ MS.Marshall (Or.) 31, a Coptic manuscript, bears Huntington's signature, crossed through, on fol. 2r. See below for Marsh, and Twells, p. 71 for mention of a manuscript of 'Abu Wallida Allama' which Huntington procured for Pococke in 1674. This is almost certainly MS.Pococke 136 [Neubauer 1459], the *Kitāb al-Luma'* of Abū al-Walid or Jonah ibn Janāh, a grammar of the Hebrew language written in Judaeo-Arabic. Pococke was also eager that Huntington should acquire for him the *Kitāb al-Bayān* and the *al-Murshid al-kāfi* two other works in Judaeo-Arabic by Tanḥum ben Joseph Yerushalmi—see Twells, pp 68-70 and 75. The three vols. of the *al-Murshid* presented by Huntington to Pococke must be MSS.Pococke 215*-b, 216 and 229 [Neubauer 1522, 1523 & 1525], which bear Huntington's name followed by the inscription 'dono misit Edwardo Pocock'.

¹³⁴ Hamilton, William Bedwell, p. 94.

¹³⁵ MS.Huntington 228 [UAM 1156].

¹³⁶ (1) MS.Huntington 94 [UAM 707]; (2) MS.Huntington 168 [UAM 815].

¹³⁷ MS.Huntington 125 [UAM 718].

¹³⁸ MS.Huntington 172 [UAM 848].

¹³⁹ MS.Huntington 188 [UAM 773].

¹⁴⁰ (1) MS.Huntington 58-62 [UAM 708, 702, 695, 699, 710]; (2) MS.Huntington 498 [UAM 844]; (3) MS.Huntington 509 [UAM 790].

¹⁴¹ MS.Huntington 141 [UAM 765].

¹⁴² MS.Huntington 106 [UAM 122].

¹⁴³ (1) MS.Huntington 119 [UAM 703]; (2) MS.Huntington 120 [UAM 698].

¹⁴⁴ MS.Huntington 123 [UAM 705].

¹⁴⁵ (1) MS.Huntington 359, fol.1v-30r [UAM 614]. *al-Nili's* compendium of Galen's commentary on the *Aphorisms* of Hippocrates; (2) MS.Huntington 600 [UAM 615]; (3) MS.Huntington 602, fol. 34v-71r [UAM 333(2) & (3)].

¹⁴⁶ (1) MS.Huntington 195 [UAM 587]; (2) MS.Huntington 436 [UAM 602].

¹⁴⁷ MS.Huntington 302 [UAM 559].

¹⁴⁸ MS.Huntington 156 [UAM 561].

¹⁴⁹ (1) MS.Huntington 23 [UAM 546]; (2) MS.Huntington 196 [UAM 584]; (3) MS.Huntington 375 [UAM 645]. *al-Manẓūmah fī al-ṭibb*, followed by the supplement, 'Tadhyl', of Ibn 'Azrūn; (4) MS.Huntington 502, fol.1v-223v [UAM 1264(1) & (2)] *al-Manẓūmah fī al-ṭibb* followed by the same with Ibn Rushd's commentary; (5) MS.Huntington 541 [Neubauer 2094]. *al-Qānūn*, book 1, in Hebrew characters; (6) MS.Huntington 602, fol. 3r-32r [UAM 333(1)]. *al-Manẓūmah fī al-ṭibb*.

¹⁵⁰ MS.Huntington 355 [UAM 628].

¹⁵¹ MS.Huntington 427, fol.1r-106v [UAM 608(1)-(5)]. Commentary on the *Aphorisms* of Hippocrates, followed by five treatises, the second being a fragment of one folio only.

¹⁵² (1) MS.Huntington 85 [UAM 553] (2) MSS.Huntington 86, 137 [UAM 551, 552]; (3) MS.Huntington 183 [UAM 588]; (4) MS.Huntington 432 [UAM 583].

¹⁵³ MS.Huntington 102 [UAM 548]. *al-Mabāḥith al-Qānūniyah*, a commentary on book 1 of Ibn Sina's *al-Qānūn*.

¹⁵⁴ MS.Huntington 433 [UAM 993].

¹⁵⁵ MS.Huntington 538 [UAM 963].

¹⁵⁶ MS.Huntington 95 [UAM 896].

¹⁵⁷ (1) MSS.Huntington 313-324 [UAM 1102-13]; (2) MS.Huntington 443 [UAM 222]; (3) MS.Huntington 536 [UAM 1141].

¹⁵⁸ (1) MS.Huntington 54 [UAM 1088]; (2) MS.Huntington 55 [UAM 1091].

- ¹⁵⁹ MS.Huntington 214, fol.1v-34r [UAM 918(1)].
- ¹⁶⁰ MS.Huntington 187 [UAM 410]. The manuscript forms the basis of the edition by Kay Öhrnberg and Sahban Mroueh (eds.), 'Ibn Sayyār al-Warrāq, Kitāb al-Ṭabikh', in *Studia Orientalia* (Helsinki, 1987), LX.
- ¹⁶¹ MS.Huntington 395 [UAM 510].
- ¹⁶² MS.Huntington 213 [UAM 396]. On archery, with illustrations.
- ¹⁶³ MS.Huntington 264 [UAM 371]. For the literature on this manuscript, see Rudolf Sellheim, *Materialien zur arabischen Literaturgeschichte*, 2 parts (Wiesbaden, 1976-87), I, p. 274, para 3.
- ¹⁶⁴ SC 8717-886.
- ¹⁶⁵ MS.Bodl.Or.516 [NAM 370].
- ¹⁶⁶ MS.Bodl.Or.250 [NAM 372].
- ¹⁶⁷ *Catalogi Librorum Manuscriptorum Angliae et Hiberniae in Unum Collecti*, 2 vols. (Oxford, 1697).
- ¹⁶⁸ Vol. 2, part 2, pp. 52-6 and 61-5.
- ¹⁶⁹ MS.Marsh 700 [UAM 64], a Qur'ān, is inscribed on fol. 4v 'Ex dono Intigerrissimi mei amici Rob. Huntingtoni 1675. Ab Aleppo'. MS.Marsh 13, a Syriac manuscript, has the inscription 'Robertus Huntington' on fol. i r.
- ¹⁷⁰ The Marsh collection comprises SC nos. 8969-9710. Manuscripts which formerly belonged to Dudley Loftus, 'the brothers Cunaeus' and 'dr.Hallifax' are marked in the SC 'Loftus', 'Cunaei' and 'Hallifax'.
- ¹⁷¹ The figures are those of the SC. See also Witkam, *Jacobus Golius*, pp. 68-71.
- ¹⁷² (1) MS.Marsh 82, fol. 59r-79(i)r [UT 42(2)]; (2) MS.Marsh 115 [UAM 922]; (3) MS.Marsh 521 [UAM 1026].
- ¹⁷³ (1) MS.Marsh 206 [UAM 992]. 'Ali ibn Ridwān's commentary on the *Quadripartitum* of Ptolemy; (2) MS.Marsh 264, fol.1v-50r [UAM 931(1)]. *al-Thamarah* (*Centiloquium*), ascribed to Ptolemy. Arabic text with Persian commentary. ? Copied for Golius by Shāhin Qandī. See Houtsma, *Uit de Oostersche Correspondentie*, pp. 65-8.
- ¹⁷⁴ (1) MS.Marsh 70 [UAM 522]. Jābir ibn Ḥayyān; (2) MS.Marsh 155 [UAM 990] Pseudo-al-Majritī, *Ghāyat al-ḥakim* ('Picatrix'); (3) MS.Marsh 216 [UAM 956 (where wrongly identified)]. *Kitāb al-Muthallath* of Ibn al-Maḥfūf (on geomancy); (4) MS.Marsh 228 [UAM 997] *Kashf al-asrār*, on divination, ascribed to Hermes; (5) MS.Marsh 262 [UAM 942]. A magical work by al-Būnī.
- ¹⁷⁵ MS.Marsh 667 [UAM 943]. See A. F. L. Beeston, 'The Marsh manuscript of Apollonius's *Conica*' in *The Bodleian Library Record*, IV (Oxford, 1952), 76-7, where, however, the *abjad* date 'tā sīn bā' should be rendered 462 (not 472).
- ¹⁷⁶ *Apollonii Pergaei Conicorum Libri Octo et Sereni Antissensis de Sectione Cylindri & Coni Libri Duo* (ed. E. Halleius) (Oxford, 1710).
- ¹⁷⁷ MS.Marsh 158, fol. 406v-650r [UAM 567(2)].
- ¹⁷⁸ MS.Marsh 357 [UAM 804] *Tajārib al-umam*.
- ¹⁷⁹ MS.Marsh 383 [UAM 745] *Kitāb al-Rawḍatayn*, part 2.
- ¹⁸⁰ MS.Marsh 515 [UAM 788] *al-Nawādir al-sultāniyah*.
- ¹⁸¹ (1) MS.Marsh 582, fol.1v-321r [UAM 809(1)]; (2) MS.Marsh 406 [UAM 762] Two copies of *al-Anis al-mutrib*.
- ¹⁸² MS.Marsh 205 [NAM 306].
- ¹⁸³ MS.Marsh 652 [UAM 1217].
- ¹⁸⁴ MS.Marsh 117 [NAM 303].
- ¹⁸⁵ (1) MS.Marsh 2 [UAM 78]; (2) MS.Marsh 178 [UAM 16].
- ¹⁸⁶ MS.Marsh 458 [UAM 353].
- ¹⁸⁷ MS.Marsh 144 [UAM 926]. Reproduced in 'facsimile' by the Institute for the History of Arabic-Islamic Science, *The Book of Constellations, Kitāb Ṣuwar al-kawākib* (Frankfurt am Main, 1986).
- ¹⁸⁸ MS.Marsh 662 [UAM 292].

¹⁸⁹ (1) MS.Marsh 136 [UAM 927]. *Ex libris* on fol. 2r; (2) MS.Marsh 189 [UAM 989] *Ex libris* on fol.1r, partially erased, see Witkam *Jacobus Golius*, pp. 64 and 73, n.24. Taqi al-Din's distinctive signature also appears in the subscription on fol. 83r of MS.Marsh 119 [UAM 930]. These three manuscripts have the numbers 'Math 20 Fol', 'Misc. in Fol. 16', Math 19 Fol' in the Golius sale catalogue, *Catalogus Insignium ... Librorum MSS. quos . . . Jacobus Golius . . . Collegit* (Leiden, 1696). Another Arabic manuscript in the Bodleian with an *ex libris* of Taqi al-Din (again partially erased) is MS.Laud.Or.261 [UAM 1051].

¹⁹⁰ MS.Marsh 309 [UAM 735]. Giorgio Levi Della Vida, *Ricerche sulla Formazione del Più Antico Fondo dei Manoscritti Orientali della Biblioteca Vaticana* (Vatican City, 1939), pp. 295, 296. Another 'Erpenius-Golius' manuscript in the Bodleian Library is MS.Marsh 358 [NAM 11], a Qur'ân which was given to Erpenius in 1610 by Isaac Casaubonus.

¹⁹¹ SC 27597-601.

¹⁹² See SC entries.

¹⁹³ MS.Bodl.Or.72 [Ethé 2187].

¹⁹⁴ (1) MS.Bodl.Or.330 [NAM 124]; (2) MS.Bodl.Or.532 [NAM 125].

¹⁹⁵ MS.Bodl.Or.509 [NAM 137].

¹⁹⁶ MS.Bodl.Or.538 [NAM 250].

¹⁹⁷ Printed at Leiden by the Elzeviers. (A copy exists in the library of All Souls' College, Oxford.) It formed the basis of the catalogue prepared for the auction which took place at Leiden on 16 October 1696, twenty-nine years after Golius' death, see note 189.

¹⁹⁸ MS.Smith 45, p.136 [SC 15652].

I am grateful to Mr A. D. S. Roberts, Keeper of Oriental Books in the Bodleian Library, for drawing my attention to this and the letter in MS.Smith 21, p. 29 (note 74).

M.B. HALL

ARABICK LEARNING IN THE CORRESPONDENCE OF
THE ROYAL SOCIETY 1660–1677

At first thought, it seems unlikely that the Fellows of the Royal Society, founded by the leaders of the ‘new philosophy’ in England in 1660 (chartered in 1662) ‘for the promotion of natural knowledge’, self-confessedly forward-looking modernists, should have concerned themselves with Islamic learning. That they did so throws further light upon the complexities of the scientific revolution as well as upon the growth of Arabick studies in later seventeenth-century England. It seems that these natural philosophers had wide interests, reaching far beyond the confines of modern science, interests which included linguistics, theology, Biblical history and religious propaganda. But also it was the case that science, especially mathematical science, required in order to progress the assimilation of the full content of ancient Greek science, much of which only existed in Arabic translation, while medieval Islamic geographers, mathematicians and astronomers were known to have had access to information not available to the scholarly world of seventeenth-century Europe.

Thanks in large part to Henry Oldenburg, its extremely conscientious Secretary from 1662 to his death in 1677, the early years of the Royal Society are exceptionally well documented. There are quite full records of meetings, conveniently gathered together and printed by a mid-eighteenth-century Secretary, Thomas Birch in his 4 volume *History of the Royal Society*¹ which covers the years 1660 to 1687; there are papers read at meetings or enclosed in correspondence in what are now called Classified Papers; and there is the correspondence, mainly conducted by Oldenburg, and in greater part preserved in the Royal Society’s Guard Books (Early Letters), many transcribed contemporaneously into bound Letter Books. It is this correspondence, at least that part (the bulk) addressed to and from Oldenburg, that makes up the greater part of *The Correspondence of Henry Oldenburg* that my husband and I have edited over what seems an almost infinitely tedious number of years.²

Perhaps for those not familiar with this work, a few words should be said about Oldenburg himself.³ He was born in Bremen about 1618 into an academic family and took his Master of Theology degree in 1639 from the *Gymnasium Illustre*, where students were expected to be good linguists (Latin, Greek, and Hebrew) and were well grounded in the liberal arts and theology. Oldenburg then spent some time at the University of Utrecht which introduced him into the Dutch learned world. After that he apparently tutored various young gentlemen, at least some of them English, becoming himself fluent in spoken and written English, French, and Italian, possibly even spending some time in England. This can be inferred from, among other things, the fact that in 1653 when he came to Cromwell's London as an emissary of the Senate of Bremen, he spoke and wrote English extraordinarily well according to no less an authority than John Milton. He got on well with Milton's circle, met the beautiful and learned Lady Ranelagh and her brother, the young Robert Boyle, and apparently decided to settle in England, perhaps influenced by Samuel Hartlib (himself originally German) that perpetual getter-up of 'schemes' for the common weal. He was in Oxford in 1656, where he was much impressed by the 'new philosophers'. Then in 1657 he left for a Grand Tour as governor to Lady Ranelagh's young son, Richard Jones. With the help of his pupil's noble name he was able to penetrate into all the cultivated circles of France and western Germany, searching out news, learned and scientific, for Hartlib and Boyle and incidentally continuing his conversion to the new philosophy.

At the Restoration he and his pupil returned to England. He was nominated as a member of the new scientific society at its second meeting,⁴ became an active Fellow, and in 1662 became its Secretary—all this, no doubt, at Boyle's suggestion. He began to act as Boyle's 'publisher' (editor) and translator (into Latin) and continued to collect news. After his appointment as Secretary (the charter guaranteed the Royal Society the right to correspond freely at home and abroad),⁵ he maintained a skillful and voluminous correspondence, mainly scientific, although he also collected political news to be forwarded to Joseph Williamson at the State Paper Office.⁶ Indeed, if (after 1665) letters were addressed simply 'Mr. Grubendol, London', they went direct to that office so that Oldenburg and the Society paid no postage; otherwise they were carried by hand to Oldenburg's house in Pall Mall, 'near to Lady Ranelagh'. Much of this correspondence provided the material for the *Philosophical Transactions*, founded in 1665, Oldenburg's invention and private venture.

These sources show clearly how close-knit a community was the world of Continental and English oriental scholarship, how much was hoped for from Arabic sources and the importance of the English for Arabic studies—through libraries or through contact in the Middle East by means of consuls, residents,

ambassadors, or travellers. These last were sometimes importuned for news of manuscripts, but more often were sent lists of queries to aid in one of the Society's recurrent interests, one especially dear to Oldenburg himself, the compiling of a 'universal natural history'. This was partly geographical, partly botanical and zoological, partly quasi-anthropological (habits, customs, religious beliefs), partly medical (what diseases were epidemic, what remedies were used). These queries (which still exist) were sent to travellers, like 'Mr. Howard's brother' (Howard being a Fellow); to the Consul of the Levant Company at Smyrna (Paul Rycaut, formerly secretary to the Turkish Embassy of Lord Winchilsea, F.R.S. 1666);⁷ to Benjamin Lannoy, English Consul at Aleppo⁸ who handed it to his physician Thomas Harpur for a lengthy Latin reply;⁹ to Stephen Flower, English agent at Isfahan; to Sir John Finch when Ambassador to Constantinople in 1672;¹⁰ to Lord Henry Howard of Norfolk when Ambassador to Morocco in 1669.

In the answers, as in the queries, there was great diversity. They dealt with climate (it was reported from Morocco that 'it was so hot in the latter end of August that it melted chocolate cake [presumably a block of chocolate, not cake for tea] and resin of jalap'); diseases and their local remedies; botany and zoology; geography, agriculture, minerals, architecture, local customs . . . all in no particular order. And occasionally, there are points relevant to scholarship. Here can be seen three interwoven strands: a general desire for knowledge of manuscript sources of medieval Islamic texts; for Arabic translations of Greek texts (or preferably, copies of the Greek texts themselves); and for linguistic aids to an understanding of medical and botanical terms and for the translation and commentary of Biblical texts.

But first, for whose benefit were these queries devised? Some of their names are discussed more fully elsewhere in this book; here it will suffice briefly to mention those whose names occur in the Royal Society's correspondence. In 1659, in the pre-history of the Society, Oldenburg in Paris sent back relevant information: for example, of the respect in which Continental scholars held the recently deceased John Greaves (1602-52), Gresham Professor of Geometry, Savilian Professor of Astronomy, author and translator;¹² then a partial list of Oriental MSS in Paris libraries for the benefit of 'Mr. Pocock and others.'¹³ Edward Pococke (1604-91), who appears often in the subsequent correspondence, was successively Professor of Arabic (1636) and of Hebrew (1648). Although never F.R.S., he was friendly with those at Oxford who were, like John Wallis, Savilian Professor of Geometry, who was himself interested in Arabic mathematical and astronomical texts. In 1663 interest within the Royal Society (see below) produced references to Thomas Hyde (1636-1703), originally a Cambridge man but translated to Oxford as Hebrew reader at Queen's and (from 1665) Bodley's Librarian.¹⁴ When in

1667/8 Wallis was asked about Arabists at Oxford, he named Pococke, Samuel Clarke (1625–69), Hyde, Robert Huntingdon (1637–1701), later Chaplain to the Levant Company; Edward Bernard (1638–96), F.R.S. and Savilian Professor of Astronomy in 1673; Narcissus Marsh (1638–1713), later to turn to an Irish translation of the Bible under the patronage of Robert Boyle; Thomas Smith (1638–1710), then of Magdalen but about to go as Chaplain to Constantinople; and John Greaves' brother Thomas (1612–76), deputy Reader of Arabic with livings in Northamptonshire, a learned scholar who had already published *De linguæ Arabicæ utilitate* (1637).¹⁵ Other scholars to be referred to in the correspondence are Brian Walton (1600?–61), editor of the *Polyglot Bible*; Edmund Castell (160–85), a Cambridge scholar and Walton's assistant, author of *Lexicon Heptaglotton* (1669) and later Professor of Arabic at Cambridge; and William Seaman of Oxford (1606–80) who had accompanied Sir Peter Wyche (FRS) to Constantinople as a young man and become an expert on Turkish, publishing a Turkish Bible and grammar. Oldenburg also knew or knew of a number of Continental orientalists, notably Levinus Warnerus (1619–65), living in Holland, of whom he wrote in 1659 'he hath been my schoolfellow at Bremen, a great lover and student of ye Orientall tongues'¹⁶ and Job Ludolf of Vienna (1624–1704) whom Oldenburg met in his visit to Germany in 1659 when he was conducting Richard Jones; Ludolf carried on a desultory correspondence over many years with Oldenburg on Coptic and 'Abyssinian' matters.

What kinds of news could Oldenburg's correspondence provide for the information of the close-knit band of Oriental scholars of the 1660's and 1670's? First and foremost, the whereabouts of Oriental manuscripts, so eagerly sought by those preparing editions of Greek and Arabic works. To give some examples over a period of time: in 1659 Oldenburg could report¹⁷ 'yt the Abyssins have among ym the goodliest library in ye world, where many books, yt are lost wth us, or but meerly mentioned, are kept entire'—but this came from his reading of George Sandys, *Relation of a Journey* (1615). More reliably, for he visited it himself, that the library of Chancellor Seguier in Paris was 'ample and excellent, stored with a good number of Orientall and African books, Arabian, Syrian, Æthiopian, and Cophtique, very finely written, and treating of Divinity, Philosophy, Physique, History, and Law.' Among the 1669 Queries addressed to Lord Henry Howard of Norfolk is

7. Whether they have y^e latter 7. books of *Diophantos*, w^{ch} are wanting in Christendom and no where to be found. Dr. Pell and others lament y^e losse of those books. 8. To inquire into any ancient MSS. y^t may possibly have been translated out of y^e Antient Greeks, either in Geometry, Astronomy, Physicke, Chymistry.

In 1672 the queries for Sir John Finch included the question, whether any Greek manuscripts 'auncient & unknowne among us' were to be found in Turkish libraries,¹⁸ while in 1676 Edward Bernard reported from Paris¹⁹ that it was possible to purchase from J.M. Wansleben (1635-79), recently returned from a collecting expedition to Egypt for Colbert, nine volumes of works on Coptic theology, including the Arabic text of Abu'l-Barakat (d.1324).

The Islamic writers whose works were sought were of course few, but the members of Oldenburg's circle of correspondence appear keenly interested in these few, whose names tend to recur with considerable frequency. There was for example, Abulfeda (Abu'l-Fidā', 1273-1331) whose treatise on geography (*Taqwīm al-Buldān*) had been partially published by John Greaves in 1650.²⁰ There is a reference in 1667 to Thévenot's translation of the Vatican MS (which he was to publish in 1672 with other Arabic texts in his *Relation de divers Voyages Curieux*). The report by Henri Justel (1620-93), Louis XIV's Protestant secretary, an omnivorous and uncritical collector and transmitter of every sort of news—scholarly, medical, scientific, political, and curious—states 'Mr. Thévenot has translated Abulfeda from Arabic into Latin. He has revised it with a gentleman from Marseille who understands that language perfectly.'²¹ Interest in Abulfeda, mainly on Thévenot's account, was to continue; thus in 1668 Wallis could report that Samuel Clarke 'will be for some time engaged in preparing a further volume of the Polyglot Bible and in revising the text of Abulfeda's Arabic and Persian geography from various manuscripts which we have here,'²² a labour never completed. In 1671 Thévenot was to write directly to Oldenburg,²³

I should tell you, Sir, . . . that I find myself engaged in the translation of Abulfeda, which is an undertaking in which the difficulty of the language is the least [impediment]; the scarcity of Oriental historians and geographers up to the present has given me more trouble than anything else.

He reported that the text was being printed and that he was sending the sheets to Edward Bernard who had offered to collate them with manuscripts in England. Thévenot stated that he had himself already collated them with three or four manuscripts and he knew of no others in Europe except those in England and in Vienna. Oldenburg asked Wallis to look into the location of the manuscripts used by Greaves and Clarke. Wallis in turn consulted Pococke, who reported that Clarke had used Greaves' manuscript (now probably in the hands of his brother Thomas), but that this was an inferior copy, and he had also used a manuscript now at Cambridge, copied by the Dutch orientalist Thomas Erpenius (van Erpe, 1584-1624).²⁴ Oldenburg sent to Paris this same year (1671) for Thévenot's use a copy of Pococke's newly

published *Philosophus autodidactus*, a translation of ibn Ṭufayl's narrative.

Islamic astronomers were still held in high esteem, and there are numerous references scattered through the correspondence to various demands for more and better copies of their works, especially of their observations. The greatest interest was aroused by the request in 1663 of the Danzig astronomer Johann Hevelius (1611-87) for a reliable copy of the star catalogue of Ulugh Beg (1394-1449), 'King [and] formerly a remarkable astronomer' as he called him.²⁵ He had, he said, learned from Wallis, with whom he was also in correspondence, that there was a Persian manuscript of Ulugh Beg's work at Oxford (this had probably been used by John Greaves in his partial Latin translation, published in 1648 in John Bainbridge's *Canicularia*). Hevelius added a caution, 'the value of the work will lie in its being the first translated into Latin, and transcribed very accurately and with great attention to the numbers.' The Society took official note of Hevelius' request and formally asked Wallis to procure a translation and transcription.²⁶ Wallis promptly took up the task, first consulting Hyde who had, he said, already translated the part concerning the fixed stars and was willing to see the whole through the press. Wallis himself transcribed the catalogue of fixed stars from Hyde's Latin 'wch [he noted] I had before compared, as to numbers, with the three Persian books, very accurately,' a transcription he sent to Oldenburg for forwarding to Hevelius.²⁷ (This was accomplished, not without some delay, by entrusting the parcel to a ship-captain sailing from London to Danzig.)²⁸ The Society hesitated whether to ask Hevelius to publish the Latin transcription with his own star catalogue, or whether to ask him to make use of it but leave publication to Hyde. Hyde was doubtful about the project because of the difficulty of getting the Persian accurately printed although, as Wallis reported, Hyde's 'chief aim in it . . . is, by publishing y^e Persian, to represent himself so to his friends from whom hee may expect encouragement, as that they may thereby be induced the rather to do something for his advantage.'²⁹ And besides, as Wallis cogently argued, if the Latin appeared first, the original of so difficult a text would never get printed. The Society wavered, but in the end Hevelius decided not to print the translation (being busy with other things and not having time for 'verifying the places of the stars').³⁰

The next year (1665) Hyde succeeded in producing both the Persian and the Latin texts, reviewed in Oldenburg's *Philosophical Transactions*.³¹ Interest continued: three years later Wallis was to write for Hevelius's information³² that besides the manuscripts of Ulugh Beg

we have elsewhere in our libraries, I hear, other tables of the same kind in Persian or Arabic and of these, if I conveniently can, I shall have transcripts made by men learned in those languages, and translated into Latin. . . . But

indeed I can only undertake this, which must depend upon others (for I am not so skilled in those languages that I can take this upon myself alone), if I shall be able to command the leisure of such scholars, who are not numerous amongst us,

naming Pococke, ('second to none in knowledge of the oriental tongues'), Hyde, Bernard and Clarke. And these few, he added, were all busily engaged on other research. In spite of this discouragement Oldenburg was able, a few weeks later, to send to Hevelius 'astronomical extracts giving the longitudes and latitudes of the fixed stars according to a Greek MS. copy of the *Almagest* and a manuscript of the Arabic version, and the tables of the celebrated Al-Šūfi all prepared by the exertions of our famous and very diligent Mr. Wallis.'³³ (Al-Šūfi is the tenth-century 'Abd-al-Raḥmān ibn 'Umar, who in his book on the fixed stars used Ptolemy's longitudes increased by 12° 42').

This story is given in some detail, because it illustrates perfectly the relation between the Royal Society and Orientalists like Hyde, and because it is possible here to trace the views of natural philosophers and linguists alike. In other cases the correspondence gives us more fleeting references. In 1670/71 Francis Vernon (?1637-77), an Oxford graduate, an adventurous traveller and at this time secretary to the Embassy in Paris under the Duke of Montagu, reported that the orientalist Barthélemy D'Herbelot (1625-95) had returned from Florence with a rich haul of 'Oriental pieces neere 200 volumes, besides a Choyce extract of his owne of all the morality, & the medicinall knowne[ledge] of the Arabs & other Levantines wth their notions of divinity. besides this hee hath severall pieces of History Mircon in the Persian language, & many others.'³⁴ More closely related to astronomy is the reference by the Astronomer Royal, John Flamsteed, in 1673, when working on his great star catalogue: he found it necessary to compare his observation with 'the more recent observations of other astronomers to set beside those of Hipparchus, Al-Battāni and Tycho.'³⁵

Mathematicians also sought Islamic sources. Alhazen [Ibn al-Haytham, d.1040] had left a famous problem in mathematical optics: to find the point of reflection from a mirror, concave or convex, when location of the eye was known. In 1669 Christiaan Huygens incidentally sent his solution of Alhazen's Problem to the Royal Society.³⁶ Oldenburg quickly instituted a mathematical three-way correspondence between Huygens, himself and the Belgian mathematician René François de Sluse (1622-85) which resulted in a number of elegant mathematical solutions.³⁷ Rather quaintly, in 1672 Bernard was to make light of the whole question, declaring that Alhazen had dealt with it quite competently for 'the prolixity of the booke proceeds from the ignorance of the Interpreter rather than Inelegance of the Arabe', adding that there was

an interesting manuscript of Alhazen in Cambridge 'in one of the Colledges' (in fact 2 MSS, fourteenth-century transcripts of other works).³⁸

Another example comes from the interest among mathematicians, especially English ones, in the recovery of a complete text of all eight books of the *Conics* of Apollonios of Perga, of which only the first four books survive in Greek (although there is a summary of Book 8 by Pappos), 5, 6, and 7 existing only in Arabic. The Greek text had been published in the sixteenth century; now strenuous efforts were made to recover and publish the whole. G.A. Borelli had in 1661 published a Latin version of books 5, 6, and 7 from a MS. in Florence. Isaac Barrow, Newton's predecessor as Lucasian Professor of Mathematics, announced a plan (never completed) for an authoritative text with a paraphrase of the commentary on the later books by 'Abalphato Isphahanensis' (Abu'l Fath al-Isfahānī c. 1119 A.D.). In 1668, as Wallis reported,³⁹ Edward Bernard was planning to go to Holland 'in order to collate the seven books of Apollonios of Perga's *Conics*, which we have here in Arabic, with some other codices of the same work so that he may in due course publish them in an amended version,' while in 1672 he was intending to 'adde the latter 3 [bookes] out of Arabick namely out of the Coppies of Beni Musa [Banū Mūsa, c 9th c.] with the notes of Eutocius [Eutochios, c. 500 A.D.] and Abdelmelech' ['Abd al-Malik al-Shirāzī, c. 12th c.].⁴⁰ By 1676 Bernard, in Paris as tutor to the Dukes of Grafton and of Northumberland, was telling orientalists that he had found in the Selden manuscripts in the Bodleian Library an Arabic version of the *De Sectione Rationis* of Apollonios and had begun a translation of it.⁴¹ He never completed any of this work, but the partial transcriptions and translations were to be used later by Edmund Halley in what is still the definitive edition of Apollonios (1706-1710).

So much for mathematics. Medicine was another subject from which much was hoped for, though less from the recovery of texts than from knowledge and understanding of the drugs used in the Islamic world. There are many references in the various Queries and their answers to the use of herbal and mineral substances, for medical and also for cosmetic purposes—like the interest in the Turkish 'rusma',⁴² a depilatory made from quicklime and auripigmentum (or orpiment, arsenic trisulphide) as the physician Thomas Harpur reliably informed the Society. From 1671 to 1674 the Hamburg physician Martin Vogel (1634-1675), already a correspondent, asked an almost endless string of questions relevant to his own work on narcotics. He had heard rumors of Pococke's little work (largely a translation from Arabic) *The Nature of the Drink Kauhi or Coffee* (1659), of which Wallis, with some difficulty, procured a copy to be sent to him.⁴³ Vogel knew of the work of Seamen, Pococke and Rycaut; and through Oldenburg begged their help on

Turkish terminology. Thus in 1672, working on what he called 'my little commentary on the Turkish *maslac*,' he stated firmly,⁴⁴

In your country there are many who are familiar with the Turkish, Arabic and Persian languages, some of whom have lived among the Turks. If it is no trouble to you then, Sir, let me be informed at the first opportunity, please, of what your friend, the very learned Pococke, and Rycaut know of this medicament, and also what other learned men who have dwelt among the Turks, whose names I do not know, have discovered about it. I have already assembled much out of the way material concerning it, but I wish to swell my little book with the evidence of your countrymen. I shall make due acknowledgement to those who shall instruct me on some point. There is no need to repeat for my sake what can be gleaned from the oriental Lexicon heptaglotton [of Castell, 1669].

Vogel added to the letter a sheet of queries addressed to Seamen, who kindly replied at some length but in the end expressed uncertainty about the derivation of the word *maslac*. (It is even now not fully identifiable, but is perhaps a derivative of *cannabis*). Oldenburg also consulted Pococke, who could only say that it was so long since he had lived in Turkey that, although he remembered the names of *maslac* and of other narcotics, he could no longer remember what they were.⁴⁵ A year later Vogel was still trying to gain information from Pococke, this time asking for reference to narcotics in the work of the geographer al-Idrīsī (c. 1100-1166), and inquiring whether there were 'any rare oriental glossaries at Cambridge, and whom there is there who is skilled in those languages?'⁴⁶ At the same time he asked Seamen to look in Akhteri's Arabic-Turkish dictionary (this was Muṣṭafa b. Shams al-Dīn, *Akhteri Kebīr*, 1545) for the words '*esrar*' and '*geuserlik*' which he thought might be Turkish.⁴⁷ Pococke, consulted by Wallis, could only say that he himself was no botanist, that transliteration was difficult, that no one dictionary could solve such a problem, and that the several (manuscript) dictionaries available were all so badly arranged that it was too time-consuming a pursuit to look for a single word.⁴⁸ (*Esrar* means secret, and refers to a preparation of hemp; *geuserlik* still evades modern linguists). Clearly in Vogel's estimation English orientalists stood high, and he expected a solution to all linguistic difficulties to result from their studies;⁴⁹ he attributed many published works to them, even apparently inventing some works, as in his reference to 'Pocock's dissertation on the sherbert of the Turks'.⁵⁰

The band of English orientalist appears in the early correspondence of the Royal Society as devoted, hard-working and obliging, much respected abroad. Oldenburg died in September 1677. With his death, interest in Arabick studies within the Royal Society appears to have languished, for there are no more references to these things in Birch's *History of the Royal Society* which itself ceases at the end of 1687. (I have not tried to pursue the matter in the archives

for the period after Oldenburg's death). Some of the scholars concerned, like Vogel, had died before Oldenburg, while some in the 1680's and 1690's turned their attention to other matters. The tastes and interests of the Royal Society's later Secretaries (none anything like so diligent as Oldenburg) lay elsewhere. But because this thread seems to disappear from the Society's correspondence, it by no means follows that those Fellows who had been concerned in its unravelling had suddenly lost that interest which has been revealed here. The interests of the Royal Society could and did encompass the work of scholars concerned with Arabick learning, especially when it came to astronomical, geographical, mathematical, and medical matters.

NOTES

¹ Thomas Birch, *History of the Royal Society* (London, 1756-57), facsimile reprint with foreword by A. Rupert Hall, (New York and London: Johnson Reprint Corp., 1968). This contains account taken from the Journal Books (of ordinary meetings) and from the Council Minutes, as well as many extracts from letters. Hereafter Birch, *History*.

² A. Rupert Hall and Marie Boas Hall, eds. *The Correspondence of Henry Oldenburg*, Volumes I-IX (Madison and London: University of Wisconsin Press 1965-73); X and XI (London: Mansell, 1975, 1977); XII and XIII (London: Taylor & Francis, 1986). Hereafter *Correspondence*.

³ See the Introduction to Vol. I of *Correspondence* and also A. Rupert and Marie Boas Hall, 'Some hitherto unknown facts about the private career of Henry Oldenburg,' *Notes and Records of the Royal Society*, 18 (1963), pp. 94-103 and 'Further Notes on Henry Oldenburg,' *Notes and Records*, 23 (1968), pp. 33-42, as well as the introductions to later volumes and the 'Additions and Corrections' at the end of Vol. XIII of the *Correspondence*.

⁴ See Birch, *History*, I, p. 4.

⁵ See Birch, *History*, I, 88 (1662 charter) and 221 (1663 charter). For the Latin with English translation, see *The Record of the Royal Society* (4th ed., London, 1940), pp. 215-86.

⁶ Many of these were first printed in the relevant volumes of *The Calendar of State Papers Domestic*.

⁷ *Correspondence*, III, pp. 343-44.

⁸ *Ibid.*, pp. 340-41.

⁹ *Ibid.*, pp. 462-67.

¹⁰ *Correspondence*, IX, pp. 338-40.

¹¹ Printed, with the answers, in Birch, *History*, III, pp. 22-29, under minutes for the meeting of 28 March 1672, from the original in Classified Papers, XIX, no. 46.

¹² *Correspondence*, I, p. 282.

¹³ *Ibid.*, pp. 291, 393.

¹⁴ *Correspondence*, III, p. 219.

¹⁵ *Correspondence*, IV, p. 141.

¹⁶ *Correspondence*, I, p. 281.

¹⁷ *Ibid.*, p. 269.

¹⁸ Classified papers, XIX, no. 80.

¹⁹ *Correspondence*, XIII, p. 33.

²⁰ *Correspondence*, I, p. 282.

- ²¹ *Correspondence*, III, p. 485.
- ²² *Correspondence*, V, p. 235.
- ²³ *Correspondence*, VIII, pp. 310-11.
- ²⁴ *Ibid.*, pp. 372, 388.
- ²⁵ *Correspondence*, III, pp. 137-39.
- ²⁶ Birch, *History*, I, p. 39, minutes for the meeting of 2 March 1663/4.
- ²⁷ *Correspondence*, II, p. 163.
- ²⁸ *Ibid.*, p. 205.
- ²⁹ *Ibid.*, p. 181.
- ³⁰ *Ibid.*, pp. 305, 396.
- ³¹ no. 8, 8 January 1665/6.
- ³² *Correspondence*, V, p. 235.
- ³³ *Ibid.*, p. 354.
- ³⁴ *Correspondence*, VII, p. 497-98.
- ³⁵ *Correspondence*, X, p. 193.
- ³⁶ *Œuvres Complètes de Christiaan Huygens*, VI (The Hague, 1895), p. 462, and *Philosophical Transactions*, no. 97 (6 October 1673), 6119.
- ³⁷ *Correspondence*, VII-X, *passim*.
- ³⁸ *Correspondence*, IX, p. 242.
- ³⁹ *Correspondence*, V, p. 235.
- ⁴⁰ *Correspondence*, VIII, p. 333, 372.
- ⁴¹ *Correspondence*, XII, p. 269-71.
- ⁴² *Correspondence*, III, p. 470.
- ⁴³ *Correspondence*, VIII, pp. 333, 372.
- ⁴⁴ *Correspondence*, IX, pp. 210 and 211, note 9.
- ⁴⁵ *Ibid.*, p. 239.
- ⁴⁶ *Correspondence*, X, p. 76.
- ⁴⁷ *Ibid.*, pp. 76-7, 77 note 9.
- ⁴⁸ *Ibid.*, p. 174.
- ⁴⁹ See the query to Seaman, *Correspondence*, X, p. 363.
- ⁵⁰ *Ibid.*, p. 362.

RAYMOND MERCIER

ENGLISH ORIENTALISTS AND MATHEMATICAL
ASTRONOMY

INTRODUCTION

The establishment of the English Church in the early sixteenth century did not have its roots in Academic or intellectual life in this country, but like all revolutions it sought eventually to legitimise itself in those spheres. There are obvious parallels to developments as far apart as the establishment of the Library in Alexandria as a monument to Alexander the Great, and that of the Ecole Polytechnique. A nearer parallel for the purposes of this chapter might lie in the developments in ninth century Baghdad which saw the foundation of a House of Learning, a legitimisation of Islamic patronage of science and scholarship. Activities there involved an intimate interaction between translation and observation, so that observations were sometimes carried out simply to resolve ambiguities in texts, and texts were used as a guide to what should be observed. This is a mode of interaction rather foreign to the modern scientist, for whom the older literature is 'just history', and who justifies observations by the needs of current theory or speculation. Activities in Oxford during the sixteenth century find the leading Churchmen of the time, Laud, Marsh and Ussher, acting as patrons of scholarship and observation in much the same way as those in Baghdad. It certainly helps one to understand the travels of Greaves and Pococke to the Middle East if this is seen as a parallel to similar searches for Greek and Indian material to be collected for patrons in Baghdad.

From a practical point of view certainly men of wealth and influence were needed to provide the means to bring to this country collections of manuscripts, and Laud, Marsh and Ussher were not slow to exercise their means in this way. Without their activities the collections of Arabic and Persian manuscripts in Oxford would have been a mere fraction of their present extent. However they were not simply interested in collecting material, but in encouraging its active use in the scientific researches of the day. In this way John Greaves especially suited their aims. His successor Edward Bernard, on the other hand, quite lacked Greaves' scientific *nous*, and corresponds much

more to our idea of an individual pursuing scholarship for its own sake.

In the following pages two lines of inquiry are followed, corresponding to these two sides, the orientalist and the scientific. An attempt is made on the one hand to document precisely the manuscript sources which Greaves and the others exploited, and to study on the other hand the scientific content of their work. The manuscripts in question are still of course in the Bodleian, except for a small number in St John's College Oxford or Cambridge University Library. In all cases the present shelf marks are those introduced since the seventeenth century, and identification can only be established by the closest examinations of the manuscripts themselves. After countless hours spent with this material, I am only too well aware of the difficulties, and of the gaps that must remain in the following report. I am also very aware of how much more material lies among the manuscript remains of these scholars themselves.

1. JOSEPH SCALIGER

The immediate background to much of English Arabism at the beginning of the Seventeenth century was created by the extraordinary researches of Joseph Scaliger (1540-1609),¹ Huguenot, pupil in Paris of the Arabist Guillaume Postel, leading Orientalist of his time. In 1593 he accepted the Chair in Leiden. His pioneering oriental researches found expression in his *De Emendatione Temporum*, of which there were three editions, 1593 (Frankfurt), 1598 (Leiden) and posthumously in 1629 (Geneva). The last may be considered as having had the greatest influence on English writers, such as Bainbridge. Scaliger turned chronology into something of a science, and in particular introduced the so-called Julian Period (named in honour of his father Julius Caesar Scaliger), in which dates are reckoned from A.D.-4713 Dec 31. The number of days counted from this point is used as a measure of time by modern astronomers, and indeed by anyone wishing to carry out astronomical calculations painlessly. Scaliger himself did not actually give such day numbers. He surveyed every calendrical system for which he had some evidence, and the modern reader is taken aback by the very great breadth of his exploration, which even included, for example, Mexican and Japanese material.

He is silent or at best laconic about his sources, and it is unlikely that one could ever determine more than a few of them. Ignatius, Jacobite Patriarch of Antioch was present in Rome from 1577 in connection with the discussions of Church Unity. Scaliger had extensive correspondence with him on numerous topics, including The Diocletian Era (Era of Martyrs), and Indian and Chinese chronology. Scaliger noted many errors in historical works regarding

the identification of Hijra dates. He gives a clear and full accounts of the Muslim and Jewish calendars. He appears not to have explored very widely amongst the Latin manuscripts of astronomical texts which would have been found in so many libraries which survived from the medieval schools, texts which included material of Arabic origin which would have been available to a student in the twelfth and thirteenth centuries. It is a useful reminder of the way in which people in Scaliger's time could be largely in ignorance of all that had passed in Europe a few centuries earlier. He appears to have consulted al-Battani and the Alfonsine Tables only in printed versions. The manuscript sources which he exploited were mainly Greek and Hebrew. In fact he collected a number of Arabic manuscripts, which have since passed to the University Library in Leiden,² but it is not clear how much use he made of these in his researches. He consulted the Greek '*Persian Syntaxis*' (ca. A.D.1346) of Chrysococces for details about the Hijra Era and a number of others, Yazdajird, Jalāli, etc., unaware indeed, that these tables were largely taken from the Zīj-i ilkhānī (ca. A.D.1270) of Naṣir al-Dīn al-Ṭūsī.³ As regards Arabic and Persian material, he has evidently made use of the following:

Alchabitii (Abdu'l-'Azīz b. Uthman b. 'Alī, Abū'l-Ṣaqr, al-Qabīsī).
Liber Introductorius ad magisterium judiciorum astrorum, Venice, 1485.

Albattani (Abu Abdallāh Muḥ. b. Jabīr b. Sinān al Battānī), *De Scientia Stellarum*, Nürnberg, 1537; Bologna, 1645. This does not include the tables of al-Battānī's work.⁴

Mishnah Torah of Maimonides, available in a number of editions printed in Constantinople, Venice, and Mantua, from the late fifteenth century.⁵ Book 3, tract 8 is on the Sanctification of the New Moon, a mathematical treatment dependent on al-Battānī's luni-solar parameters.

Muḥ. b. Muḥ. al-Idrīsī, *Geography (Nuzhat al-Mushtāq)*. Scaliger knew only an anonymous condensed version (Medici Press, Rome 1592).⁶ This was followed shortly by a translation by Sionita⁷ who acknowledges the assistance of Scaliger and Erpenius. It is clear that none of them knew the author's identity, which was first established by Jacob Golius in his notes to al-Farghānī.⁸ Scaliger simply refers to him as the Arabic Geographer.

Alfonsine Tables, various printed editions from 1483.
Abraham Ibn Ezra, *Reshit Hokma, (Incipium Sapientiae)*⁹
Georgios Chrysococces, *Syntaxis Persice*. Greek manuscripts.¹⁰
A certain Persian calendar.

2. JOHN GREAVES

2.1. John Greaves as an Orientalist

John Greaves (1602-1652) showed an interest in scientific matters at least by the time of taking his M.A. in Oxford in 1628, and was associated with some of the leading Oxford figures in mathematics of his time, Henry Briggs, John Bainbridge, and Peter Turner. At an early stage in these studies he tried to make himself familiar also with Oriental sources in mathematics and astronomy. His academic career began with his appointment in 1630/31 to Gresham College as Professor of Geometry. At this time (1630-33) he undertook observations in Oxford of solar and lunar eclipses, apparently working with Bainbridge there.¹¹ After a brief visit to Italy in 1635, he returned to England. Under the patronage of William Laud, Archbishop of Canterbury, he then prepared for a visit to the East, leaving London in 1637. In Rome he made measurements and drawings of classical remains, which served him in his attempt to determine the length of the Roman foot, and he also determined the latitude of that city as 41;46. From there he went on to Constantinople, and afterwards to Rhodes, Alexandria and Cairo. In all these places he carried out observations, which are examined in detail in the next section; he also carefully surveyed the pyramids near Cairo. On his return to Oxford, perhaps in 1640 or 1641, he continued his observations.

In the course of his travels he collected manuscripts where he could, and the large collection under his name¹² in the Bodleian Library, Oxford, is a witness to the many important works which he found. He was hardly alone in these searches, for Pococke (1604-1691) and especially Golius were also very assiduous in finding manuscripts. Greaves made much use of the manuscripts of copies of the works of Ulugh Beg and Abū'l-Fidā'.

On the death of John Bainbridge¹³ (b.1583) in Nov 1643, Greaves was appointed to succeed him in the Savilian Chair of Astronomy.¹⁴ Soon afterwards he began an important series of publications.¹⁵ The first appeared in 1646, giving an account of his measurements of the pyramids. Always mindful of scientific implications, he remarked that since the sides of the pyramids were aligned very precisely along the cardinal directions, this is a proof that the axis of the earth's rotation had never altered in the great time since they were constructed. That such a change might have occurred was a question considered by astronomers during at least the preceeding century and a half.

In his work on ancient and foreign units of measurement, published in 1647,¹⁶ he determined the Roman foot to be 29.47 cm, and the Greek foot to

be 30.7 cm. He reckoned in terms of an iron standard of the English yard kept in the Guildhall in London,¹⁷ from which he made a copy in brass for the foot unit, divided into 2000 parts, with the aid of 10 transversals. In Cairo he found the cubit to be 1824/1000 feet, that is 55.6 cm. These measurements continued to be quoted long afterwards, although the Greek foot of 30.7 cm in particular is no longer accepted as correct. The modern estimate of the Roman foot is 29.6 cm. His work was continued by Edward Bernard, in his *De mensuris et ponderibus antiquiorum* of 1688

Greaves quoted two Persian astronomical authors, *Shah Cholgi*, and *Aly Koshgy/Cushgy*, who are identified as follows.

Shah Cholgi.¹⁸ This is Maḥmūd Shāh Khaljī, ruler of Malwa 839/1435 to 873/1469. He wrote a work entitled *Zij-i Jāmi'* In his *Astronomia Quaedam ex traditione Shah Cholgi Persae: una cum hypothesibus planetarum*,¹⁹ Greaves provides the Persian text together with a facing Latin translation, in 97 pages each. The manuscript,²⁰ at least in its present form, is acephalous. The work originally consisted of an introduction, two chapters and an appendix,²¹ of which the introduction and one chapter survive. The Introduction is concerned with arithmetic, and with simple astronomical observation, including some remarks on taking altitudes and the use of the astrolabe. The following chapter is concerned with chronology, true longitudes, almanacs, conjunction and opposition, eclipses, and astrological matters. Although incomplete, it covers the usual topics to be found in the chapters of any *zīj*. The sections 7-9 on the determination of feast days in the various calendars is heavily annotated by Greaves.²²

Aly Kushgy/Cushgy.²³ In the fourth part of a work published in 1650, and reprinted in 1652, *Ali Kushgii de terrae magnitudine & sphaerarum coelestium a terra distantiis*,²⁴ Greaves quotes from the *Risāla dar 'ilm al-Hay'a* of 'Alī b. Muḥ. 'Alā al-Dīn al-Qūshjī.²⁵ This Persian author was the son of an official of Ulugh Beg, and also a student of Qāḍī Zādeh. He assisted at the observatory of Ulugh Beg and completed his famous *Zīj*. After the death in 853/1449 of that Prince he went to Constantinople, where he died in 879/1474. Here Greaves draws from a manuscript in his own collection,²⁶ containing two works by this author: *Tract on Arithmetic (Risāla dar 'ilm al-Hisāb)*, ff.1-31, *Tract on Astronomy (Risāla dar 'ilm al-Hay'a)*, ff.32-65. The latter is in the tradition of the many commentaries on the *Tadhkira* of Naṣīr al-Dīn al-Tūsī, a sophisticated 'Theorica Planetarum'. Greaves has annotated it towards the end, and has added a list of arithmetical terms on a blank leaf at the front.²⁷

In his *Elementa Linguae Persae*,²⁸ Greaves illustrates the Persian language with a quotation from 'Shah Koshgius',²⁹ in which the distance of the eighth sphere is given, as 33,524,309 farsākhs.³⁰ Greaves refers to him also in his

work of 1647 on the Roman foot.³¹

The works of 'Alī Qūshjī and Maḥmūd Khaljī are relatively secondary sources, although to one in Greaves' position, they were naturally welcome. He came to know, however, other works of far greater importance. These were the *Zij-i ilkhānī* of Naṣīr al-Dīn al-Ṭūsī, the *Zij-i Jadīd-i Sultānī* of Ulugh Beg, and the Geographical tables of Abū'l-Fidā'.³² He was also drawn to study the Greek *Persian Syntaxis* of Chrysococces, which he came to know in the Barocci manuscripts.³³

The *Zij-i Jadīd-i Sultānī* is available now in a number of manuscripts, listed by Ethé.³⁴ One belonged to Greaves and is now classed as Bodley MS Greaves 5 (S.C.3773, Ethé 1515). Other copies which were used by him are found in St John's College, Oxford.³⁵ In that library, MS 91 is an Arabic version, inscribed with the name of Laud on f.2, with the date 1640. We know that Greaves enjoyed the patronage of William Laud, Archbishop of Canterbury, and Chancellor of the University of Oxford, and we might suppose that these manuscripts were purchased by Greaves on his behalf. The margins of ff.4-5, by the side of Maqālat 1, are filled with Greaves' annotations on the epochs. He clearly made use of this manuscript for his *Epochae Celebriores* 1650(1)a. The other copy of the *Zij* of Ulugh Beg, St John's MS 151, also belonged to Laud.³⁶

Of the *Zij-i ilkhānī* there are now in Oxford only two copies, the Persian text, and an Arabic translation, both in the collection of Robert Huntington.³⁷ The translation was made by Aḥmad b. Ibrāhīm b. Khalīl al-Ḥalabī, Shihāb al-Dīn Abū'l-'Abbās, d. 859/1455, the Muwaqqit (Time-keeper) of the Umayyad Mosque in Damascus, like Ibn al-Shāṭir before him. In this Arabic version the annual motions are given for both Yazdajird and Hījra epochs, from A.H. 801 (complete), and A.Y.800 (complete), respectively. The problem, however, is that manuscripts of the 'Hunt' class were not collected by Robert Huntington (1637-1701) until after 1670, when he went to Aleppo as Chaplain to the Levant Company; they were purchased for the Bodley in 1693. Clearly manuscripts obtained by this route arrived in England too late to have been used by Greaves. Nevertheless Greaves had access to manuscripts of this work,³⁸ and indeed in 1650 he printed the geographical table from it in his *Binae Tabulae*, 1648(2). In his notebook,³⁹ Greaves lists the various motions from the *Zij-i ilkhānī*, indeed from Arabic, Persian and Greek, and this can scarcely mean anything but a quotation from these two Persian and Arabic versions, as well as the *Persian Syntaxis*. We are forced to conclude therefore that these two Hunt manuscripts were already in Oxford in Greaves' time, and later found their way into the Huntington collection. They still form part of the collection, in spite of the fact that an effort was made

at one time to weed out from it manuscripts not obtained by Huntington himself. Although Greaves was in the habit of annotating his manuscripts, neither Hunt 143 nor Hunt 144 have annotations by anyone.

The *Persian Syntaxis* of George Chrysococces is a Greek astronomical handbook translated from Persian sources ca. A.D. 1340.⁴⁰ All of the tables of Sun, Moon and planets in the *Persian Syntaxis* are in fact just a Greek transcription from the *Zij-i ilkhānī*. It is now a clear inference from Greaves' remarks in his various notes that he understood this connection, although I was quite unaware of this when I rediscovered it.⁴¹ I said then that, "The truth of this is evident to anyone who will make the comparison, and it is not a little surprising that some 700 years should have passed before this was done." Now one can reflect sadly that Greaves' observation has been buried for so long. None of these four copies of the *Persian Syntaxis* has any annotation by Greaves.⁴² According to Birch⁴³ Greaves had intended to publish this work, but I have not seen any indication of this in the material which I have examined. Towards the end of Greaves' life, Bullialdus (1605-1694)⁴⁴ published short but very useful extracts from the tables in *Syntaxis*, but indicated nothing of the Persian source. Apparently Bullialdus knew nothing of Greaves' work on this material.⁴⁵

Greaves studied two other authors of great importance, Ibn al-Shāṭir and al-Hāshimī, who both wrote in Arabic. The *Zij al-Jadīd* of the great Damascene astronomer Ibn al-Shāṭir (ca. 1340) was known to him from one of John Selden's manuscripts.⁴⁶ On one of the fly leaves, iii verso, Greaves has listed place names, and in the text there are here and there marginalia in Greaves's hand. 'Alī ibn Sulaimān al-Hāshimī was the author of *The Book of the Reasons behind Astronomical Tables* (*Kitāb fī 'ilal al-Zijāt*), known to us only from another of Selden's manuscripts.⁴⁷ Of his date nothing is known, except that it is before 1288, the date of the manuscript. This copy is much annotated by Greaves, where he has written the names of many of the Zijes which were commented on by al-Hāshimī, as well as technical details of Indian astronomy, and other matters.⁴⁸

2.2 Observations of Meridian Altitudes

In his notebook⁴⁹ Greaves lists a number of records of meridian altitudes. These are listed in Table I, along with the latitudes derived from the altitude by calculation using modern parameters.⁵⁰ In a few instances Greaves gives the results of his own calculations, and these are given also in Table I. He states that he has not allowed for either the parallax of the Sun or the Moon, or for atmospheric refraction. The latitude of Oxford was also determined by John Bainbridge, to whom Greaves also referred for an eclipse observation at

Oxford, the last in Table I. The dates are those given by Greaves, always Old Style, as he indicated himself (st.v.).

Table I

Place and Date			Object		Observed Altitude		Calculated Latitude
Constantinople							
1638	Mar 11	(2319407 ⁵¹)		Sun	49	31 / 100	41; 2 , 22
1638	Jun 10	(2319498)		Sun	72	40 / 100	41; 0 , 26
						Greaves modern	41; 6 41; 2
Rhodes							
1638	Sep 11	(2319591)		Sun	53	53 / 60	36; 36 , 29
						Greaves modern	37; 50 36; 26
Cairo							
1639	Mar 2	(2319763)	α	CMa	43	65 / 300	30; 25 , 1
1639	Mar 3	(2319764)	α	CMa	43	65 / 300	30; 25 , 1
						modern	30; 3
Alexandria							
1639	Mar 24	(2319785)		Sun	64	50 / 300	31; 8 , 45
	Mar 24	(2319785)	α	Vir	49	182 / 300	31; 8 , 42
	Mar 25	(2319786)	α	Sco	33	92 / 300	31; 8 , 47
	Mar 26	(2319787)		Sun	64	283 / 300	31; 7 , 50
						modern	31; 13
Ligorno							
1639	Jun 17	(2319870)		Sun	69	88 / 100	43; 30 , 8
	Jun 18	(2319871)		Sun	69	82 / 100	43; 31 , 24
						modern	43; 33
Oxford							
1641	Jun 9	(2320593)		Sun	61	224 / 300	51; 44 , 6
1641	Jun 11	(2320595)		Sun	61	225 / 300	51; 44
						Greaves	51; 45
						Bainbridge	46'
						modern	51; 46

In his manuscript copy of Abū'l-Fidā',⁵² he has given, on one of the endpapers a number of observations made in Oxford between April and September 1641. These are in all cases determinations of the Noon altitude of the Sun, using either his 'instrument of 10 fete', or his quadrant of four feet, which have been mentioned above, in the notice of his other instruments. The observations are listed in Table II.

Table II

Instrument of 10 feet				observed altitude	calculated latitude
1.	1641	Apr 19	(2320542)	53 35 / 300	51;46, 10
2.	1641	May 9	(2320562)	58 34 / 300	51;47, 27
3.	1641	Jun 9	(2320593)	61 223.5 / 300	51;44, 12
4.	1641	Jun 11	(2320595)	61 225 / 300	51;44, 34*
5.	1641	Jun 14	(2320598)	61 213 / 300	51;44, 53
*G: 51;45 ⁵³					
Four foot quadrant				observed altitude	calculated latitude
6.	1641	Sep 12	(2320688)	51 60 / 100	51;44, 22
7.	1641	Sep 13	(2320689)	51 90 / 100	51;38, 54
8.	1641	Sep 14	(2320690)	52 40 / 100	51;45, 26
9.	1641	Sep 16	(2320692)	53 22 / 100	51;47, 41

The 3rd and 4th observations in Table II have already been given in the previous list in Table I, except that there the altitude on June 9 was 224, and now more precisely 223.5. He expresses this as follows,

Sun merid 61 223⁵⁴/300 & 1/600 that the 61 226/300 wanting halfe a minute for the compl. was 28 74/300 <plus> nearely halfe a minute.

For the observations numbered 6 to 9, he gives the complement of the altitude, that is the zenith distance, adding that the second in that group is 'not very good'.

He recorded an early observation of the heliacal phase of Sirius which he made in Oxford a year after taking his M.A., induced perhaps by his reading of Bainbridge's *Canicularia*, which he was eventually to publish in 1648,⁵⁵

1629 17d Apr st.v. Canis Maior, hic est Sirius heliace occidebat, 15 Aug. st.v. ortu heliaco apparebat post 4i mensium perpetuam krupsin in horizonte Oxonii.

His mode of calculation is sometimes quite clear, enough to show that he assumed for the obliquity the value 23;30. The observations of 1638 Jun 10 and 1641 Jun 11 were both assumed to be at the solstice, when we have the latitudes,

$$90 - 72 \frac{400}{100} + 23;30 = 41;6, \quad 90 - 61 \frac{225}{300} + 23;30 = 51;45.$$

The calculated latitudes are generally very close to the correct value. Certainly a modern astronomer would be surprised that results as good as these could be obtained with such 'primitive' instruments. The best results

were obtained at Alexandria and Oxford, and the worst at Cairo. In the case of Rhodes his own calculation of the latitude came out about one degree too large, although the original measurement was not that bad. This was therefore due not so much to the tense circumstances in which he measured the altitude, as described in the passage quoted below, as to a later error in calculation. The precise point at which the error was committed is not evident. His account of the visit to Rhodes is quoted in the next section.

The fractions quoted in the expression of the altitude provide an indication of the precision available with the instrument used on each occasion. Thus the small astrolabe of Gemma Frisius (which had on the back the universal projection, which originated with al-Zarqāla) was divided into minutes, while in the others, the degree was divided into intervals of $1/100$ degree and into $1/300$ degree, (12 seconds), respectively. The last instrument was a brass quadrant of seven foot radius, as he tells us in the note quoted below. In another list of observations, given below, he mentions another instrument with which he also made measurements to the nearest $1/300$ degree, but this time one 10 feet in size,⁵⁶ as well as a four foot quadrant giving $1/100$ degree. One would expect that this last quadrant was the one giving that precision which he took to the East.

A 14" astrolabe at present in the Museum of the History of Science in Oxford, has been described by Gunther.⁵⁷ It is one made by Thomas Gemini in 1559, and carries the inscription

1559 Acad. Oxon. in usum praecipue Prof. Savilianorum: ex dono Nic. Greaves
STD. In memoriam (Tho Bainbridge M.D.) olim Astronomiae Jo. Greaves
A.M.N. fra <Nicolai fratris>: Prof. Savil.

Gunther⁵⁸ assumed that it was this instrument which was referred to in the Inventory of the Instruments of the Savilian Professors. This may be true, but it might be doubted whether it was the instrument employed by Greaves at Rhodes. For this instrument is calibrated only in degrees, as one may see from the illustrations provided by Gunther,⁵⁹ in contrast to the two-foot instrument of Humphrey Cole⁶⁰ which is divided into intervals of 10 arc-minutes. Greaves would have been able to make only a very crude estimate of the fraction of the degree with this instrument, and is unlikely to have quoted the Sun's altitude as 53;53, although that may after all account for the inaccuracy of his measurement there.

The seven-foot quadrant is that described by Gunther⁶¹ as a Mural Quadrant of 6 feet 9 inches radius signed *Elias Allen fecit Londini 1637*, and listed in the inventory of instruments of the Savilian professors as 'Mural Quadrant with brass limb of the six-feet radius'. The instrument is kept now in the Museum of the History of Science in Oxford. The calibration is

described by Gunther: ‘. . . finely engraved with a scale that gives direct readings to two minutes, each degree being divided by 30 diagonal lines, which are again crossed by ten concentric arcs, giving readings to 12 seconds of arc’. A photograph of the scale is given by Gunther.⁶²

Nothing is known of the fate of the four foot quadrant, nor of the ten foot instrument, but the former may be that referred to in the inventory, No.2, ‘Brass quadrant of three-feet radius supported’, and the latter as No.6, ‘Wooden octant of ten-feet radius’.

His two stellar observations at Alexandria are impressively consistent with the two solar observations there, and indicate that he adopted a point of observation to the south of the city.

His observation of the culmination of α Virginis at Alexandria heads a note included in one of the Ussher volumes,⁶³ which includes some marginal notes by Ussher himself. A transcription of this page is shown below. Here the date of the observation is stated as *Anno Domini mense Aprilis*, although the altitude $49^{\frac{182}{300}}$ is the same as that given above in the Smith manuscript, and it may be a case of his thinking of the Gregorian date corresponding to it, which would be April 3. As in the earlier note, Greaves does not give the latitude of Alexandria implied by his own observation, but instead quotes a number of other values, from Ptolemy’s *Geography*, Abū’l-Fidā’s *Taqwīm al-Buldān* (which in turn quotes four sources), the *Zij-i ilkhānī* of Naṣīr al-Dīn al-Ṭūsī, and the *Persian Tables* of George Chrysococces. It is most interesting to read a marginal note on this page which is certainly in Ussher’s hand, not Greaves’, where it is stated that these ‘Persian Tables’ are translated from the *Zij-i ilkhānī*. It is not clear just how far Ussher understood this to be the source of the Greek tables,⁶⁴ but Greaves, as noted above,⁶⁵ quoted parameters from it along with those from the Persian original and the Arabic version.

Transcription of Greaves’ notes from Abū’l-Fidā’ and Chrysococces concerning the coordinates of Alexandria, from MS Bodley Add. A.380, f. 180:
(The Arabic expressions in the original are transcribed in italics.)

Anno domini 1639 Mense Aprilis

Meridiana altitudo Spicae Virginis 49 gr 182/300, hoc est, 49.36°.24’

Alexandriae in Egypto observata, cum quadrante aeneo, cuius radius erat pedum.

E Lib. 4^o. Geogr. Ptolem.

μηκ[ος] πλάτος
ξ λα

Αιγύπτου πάσης μετρόπολις Ἀλεξάνδρεια

Ex tribus MSS Abulfedae Arabicis, uno Erpenii, altero Pocockii, tertio meo.

longitudo <i>Iskandariya</i> sive	51.54	<i>Aṭwāl</i>	51.14	MSS Erpenii
Alexandriae a litore maris	52.44	<i>Qānūn</i>	52.48	et Pocockii
Occidentalis	51.20	<i>Ibn Saʿīd</i>		
	51.20	<i>Rasm</i>		
Latitudo eiusdem	30.18	<i>Aṭwāl</i>		
	30.18	<i>Qānūn</i>		
	31.32	<i>Ibn Saʿīd</i>		
	31. 5 ^a	<i>Rasm</i>		

E Codice MS Nassir Eddini^b Persae

Longitudo Alexandriae 61.54
ab Insulis Fortunatis

Latitudo 30. 58

^c
Eadem etiam longitudo, et latitudo, Alexandriae reperitur, quae Nassir Eddini,
IV MSS Persicis Ulug Begi, magni Timurlani nepotis.

Various further notes by Greaves and Ussher:

- a Usher: recte
- b Usher, left margin:
Ex quo Persicae Georgii Chrysococcae Tabulae sunt translatae
- c Greaves, left margin:
E Cod. MS Graeco Tabb. Persicaum in Bibliotheca Bodleiana

$\mu\eta\kappa[\omicron\varsigma]$ $\pi\lambda\acute{\alpha}\tau\omicron\varsigma$
 $\text{'}\Lambda\epsilon\zeta\acute{\alpha}\nu\delta\rho\epsilon\iota\alpha$ $\nu\alpha^{\alpha}$ ν $\lambda.\nu\eta$
- d Usher, written below $\nu\alpha$: a mari occidentali

A number of observations of eclipses, made either by Greaves, or others known to him, are also listed in MS Smith 15 (pp. 49-50). It includes 3 observations of the lunar eclipse of 1638 Dec 10, in Coventry, Alexandria and Constantinople.⁶⁶

Table III

Oxford				
1630	May	31/June 10	Sun	Greaves
1631	Oct	29/Nov 8	Moon	Greaves
1632	Oct	17/27	Moon	B<ainbridge>
1633	Mar	29/Apr 8	Sun	Greaves

Table III (cont.)

Marana, Malay Peninsula				
1634				Roger Fry ⁶⁷
Constantinople				
1638	Dec	10/20	Moon	Panagiota ⁶⁸
Alexandria				
1638	Dec	10/20	Moon	Greaves
Coventry (latitude stated as 52;29)				
1638	Dec	10/20	Moon	Foster ⁶⁹
Rome				
1641	Oct	8/18	Moon	Gasparo Berti ⁷⁰

He generally notes the altitudes at the start and end of the eclipse, and sometimes details regarding nearby stars. For example (p. 50),

Eclipsis lunae 1638 Dec 10/20.

Alexandriae in Aeg. observata

Sub finem Eclipsis alt. lunae, 14 1/2 eodem tempore altit lucidioris stellae in humero Gemini 33 1/2 Distantia inter finem Eclipsis et ortum Solis 1h 1' 1/2.

He apparently made no calculations from these data.

2.3 The latitudes of Byzantium and Rhodes

In the course of his travels, Greaves discovered that the latitudes of Byzantium and Rhodes were given inaccurately by Ptolemy and by Arabic sources. These studies⁷¹ were first communicated to Bishop Ussher, and led him to explore the newly discovered geographical work of Abū'l-Fidā'. He writes⁷²

To the most Reverend Primate of Ireland.

Upon intimation of your Grace's desires and upon importunity of some learned men, having finished this Table, as a key to your Grace's exquisite disquisition touching Asia properly so called, I thought my selfe obliged to give both you, and them a reason, why in the situation of Byzantium, and of the Iland Rhodus (which two eminent places I have made the παράπηγματα, and bounds of my

Chart) I dissent from the tradition of the Ancients, and from the tables of our late, and best Geographers: and consequently dissenting in these have been necessitated to alter the latitudes, if not the longitudes, of most of the remarkable Cities in this discourse.

He goes on to mention the latitude of Byzantium given by recent geographers, and by Ptolemy. He stresses the qualities of 'Abulfeda, an Arabian Prince in his *Taqwīm al-Buldān*, or *rectification of Countries*, about three hundred years since'.⁷³) He notes then the tables given by Naṣīr al-Dīn al-Ṭūsī and Ulugh Beg, in their astronomical tables. On the sources of Abū'l-Fidā'⁷⁴:

Abulfeda chiefly follows foure principal Authors, as his guides, in the compiling of his Geographical tables, those are al-furs Alfarras, the Author of the booke stiled al-aṭwāl wa'l-'urūd, al-Bīrūnī Albirunī the Author of al-Qānūn, Ibn Sa'id al-Maghribī Ibn Sa'id Almagraby. Lastly Baṭlamīūs Ptolemy, whose Geography he termes Rasm rub' al-ma'mūr a description of the quadrant (or fourth part of the earth) inhabited, and all these according to his assertion place Byzantium in 45 degrees of Latitude. And here it may justly be wondered, how this difference should arise, between the Greeke copies of Ptolemy, and those translated into Arabicke, by the command of Almamon, the learned Calife of Babylon. For Abulfeda expertly relates that Ptolemy was first interpreted in his time: that is on that computation of /154v/ Almecinus⁷⁵ in Erpenius edition and of Emir Cond a Persian historiographer more than 800 years since. Concerning which Abulfeda writes thus

wa huwa kitāb naqāla min al-lugha al-yūnaniya ilā al-lugha al-'arabiya wa 'araba li'l-ma'mūn

This booke (discoursing of Ptolemies Geography) was translated out of the Grecian language into the Arabicke for Almamon. And in this I finde (by three faire manuscripts of Abulfeda) Byzantium to be constantly placed in 45, and as constantly in the Greeke copies in 43.5'. But in the Προχείρος κανόνες of Chrysococca, out of the Persian tables, (made about the year 1346 in Scaligers calculation) it is placed in 45.

He goes on to refute the notion that the discrepancy might have arisen from scribal error.

The best way to end the dispute will be, to give credit concerning the latitude of Byzantium neither to the Greekes, nor Arabians. And that I have reason for this assertion, appears by several observations of mine, at Constantinople, with a brass sextans of about foure feete the radius. Where taking, in the summer solstice, the meridian altitude of the sunne, without using any προσθαφαίρεσις for the parallaxe, and refraction (which at that time was not necessary) I finde the latitude to be 41 degrees 6 minutes /155r/.

And in this latitude in the Chart I have placed Byzantium, and not in that either

of the Greekes, or Arabians. From which observations, being of singular use in the rectification of Geography, it will follow by way of corollary: that all maps for the North East of Europe, and of Asia, adjoining upon the Bosphorus Thracius, the Pontus Euxinus, and much further, are to be corrected; and consequently the situation of most cities *in Asia properly so called*, are to be brought more Southerly, than those of Ptolemy by almost two intire degrees, and then those of the Arabians by almost foure.⁷⁶

Concerning Rhodes, he discusses the errors of Ptolemy, whom he is prepared to excuse for places far distant from Alexandria, such as London.

Wherefore to excuse these errors of his (or rather of others fathered by him) with a greater absurdity, by asserting the poles of the world since his time to have changed their site, and consequently all Countries their latitudes, as Mariana⁷⁷ the Maister of Copernicus, and others after him have imagined: or els to /156r/ charge Ptolemy, being so excellent an Artist, with ignorance, and that even of his owne country, as Claverius hath done (from which my observations at Alexandria, and Memphis may vindicate him) the former were too great a stupidity, and the latter too great a presumption. But to return to Rhodes, an Iland (in Eustathius comment upon Dionysius Περιήγησις) of 920 furlongs circuit, where according to Ptolemy the parallel passing δια 'ροδου hath 36 degrees, of latitude, and so hath Lindus, and 'Ιηλυγός the chief cities of the Iland⁷⁸; the same is confirmed by the manuscript. but where the printed copy, and Eustathius reads 'Ιηλυγός, which Mercator renders Jalyssus, the manuscript renders 'Ιλισόσ. Abulfeda in some copies situates the Iland Rhodes (for he mentions no cities there) in the latitude of 37 degrees and forty minutes, and the Geography of Sa'id ibn 'Alī al-Jurjānī (Said Ibn Aly Algiorgany) commented by Gilbertus Gaulmyn.⁷⁹ By my observations under the wall of the City Rhodes, with a faire brasse Astrolabe of Gemma Frisius containing 14 inches in the diameter, I found the latitude to be 37 and 50'. A larger instrument I durst not adventure to carry on shore, in a place of so much ielousie, & this could not have passed safely, but that being covered and made up in the figure of a [illegible] the credulous Turkes had no suspicion of it.⁸⁰ And this latitude in the chart I have assigned to the City Rhodes (from the Iland so denominated upon which on the North East side it stand situated) better agreeing with the Arabians, than with Ptolemy, (whom I know not how to excuse).⁸¹

The modern edition of Abū'l-Fidā' gives the following coordinates for Alexandria and Rhodes,⁸²

Table IV

		Long	Lat
Alexandria	Aṭwāl	51;54	30; 58
	Qānūn	52; 0	30; 58
	Ibn Sa'id	51;20	31; 31
	Rasm	51;20	31; 0
Rhodes	Aṭwāl	51;40	36; 0

Abū'l-Fidā' as a rule quotes a number of sources for the latitude and longitude. Aṭwāl (which simply means 'longitudes') refers to a work which is known to us only from these quotations, and to which Abū'l-Fidā' gives the name *Kitāb al-Aṭwāl wa'l 'urūḍ li'l-Furs*, (*The Book of Longitudes and Latitudes of the Persians*); Greaves has read Furs as al-Faras, which he has taken to be the author's name. In fact, the author is not named, and his date cannot be estimated, although Reinaud regarded him as earlier than al-Bīrūnī. It is quoted by Abū'l-Fidā' for 452 places. Qānūn is the *Qānūn al-Mas'ūdi* of al-Bīrūnī, fl. A.D.1040, known to us from a few manuscripts.⁸³ Raṣm refers to a work described by Abū'l-Fidā' as an Arabic translation from Greek ordered by the Caliph Ma'mūn, and named *al-Rub' al-Ma'mūr* (*The Inhabited Quarter*). It is in fact the geographical list of al-Khwārizmī, now known from one manuscript only, edited by Mzik⁸⁴; the coordinates of places are collected from it by Kennedy.⁸⁵ Ibn Sa'id refers to the list compiled by Abū'l-Ḥasan 'Alī b. Mūsā b. Sa'id al-Maghribī (d. A.D.1286), also known to us from a modern edition by Vernet.⁸⁶ In his note on these sources, Greaves errs particularly in that, having no knowledge of al-Khwārizmī's geographical list, he took the Raṣm to be the work of Ptolemy. Even without that knowledge, however, he should have noticed the plain differences from Ptolemy's coordinates, since the longitudes differ by some 10 degrees as a rule. Ptolemy puts Alexandria, for example at longitude 60;30, while according to the Raṣm it is 51;20. Two other sources are used by Abū'l-Fidā', a fact not remarked by Greaves: these are Qiyās, taken from the *Zij al-Mumtaḥan*, and a *Zij*, otherwise unidentified.

Greaves knew the work of Abū'l-Fidā', as he says, through three manuscripts, one belonging to himself, and two others in the possession of Pococke and Erpenius. The copy belonging to Greaves⁸⁷ was copied on AH 968 Šafar 20 (1560 Nov 10), according to its colophon. Alexandria is given the coordinates listed in Greaves notes (p.167 above), except that the latitude according to Ibn Sa'id in Graves 2 is 31;31, not 31;32. In this copy on the originally blank pages (i, ii) at the beginning, Greaves has a note referring to his teacher 'Georgio' in Cairo,

nel mese di settembre in primo giorno comminciana Panno a Martyribi Copht
1355 h.e.1638 cosi dicia mio Maestro Giorgio a Gran Cairo fuori di suo libro.

and a list of nine observations which he made in Oxford, which are noted previously in section 2.2. Following the observations listed on f.i verso, Greaves writes

What bookes are to be read by a student of astronomy according to my Sheics opinion at Cairo.

There follows 12 lines in Arabic, listing various topics and books, such as *Taqwīm* (almanacs), *Hay'a* (astronomy), 'ilm al-Handasiya (mathematical theory), and naming the *Zīj* of Ulugh Beg, the *Irshād al-Ḥā'ir* of Ibn al-Majdī (d.850/1447),⁸⁸ the *Kashf al-Qinā'* of Ibn al-'Aṭṭār,⁸⁹ the *Tadhkirat* (of Naṣīr al-Dīn), the *Mukhtaṣar* of al-Jaghminī,⁹⁰ the *Wāṣil al-Ṭāllab* of Sibṭ al-Māridīnī (d. ca.900/1494).⁹¹

Greaves refers to a MS of Pococke, but there are now in the Bodley two copies of the work among the Pococke manuscripts, 196, 379 of that collection. The copy which belonged to Erpenius is now in Cambridge.⁹² The entries for Alexandria in these three copies are as follows.

Table V

	Bodley Pococke 196		Bodley Pococke 379		Cambridge UL Dd.1.2	
Aṭwāl	51;14	30; 18	51; 14	30; 18	51; 14	30; 18
Qānūn	52;44	30; 18	52; 0	30; 18	52; 48	30; 48
Ibn Sa'īd	51;20	31; 31	51; 20	31; 31	51; 20	31; 31
Rasm	51;20	31; 0	51; 20	31; 0	51; 20	31; 0

In the Cambridge manuscript there are a number of interlinear glosses in Greaves' hand, pp.235-241, and also various other marginal remarks written curiously in what might be taken for a late medieval hand. The whole MS however is Erpenius' copy in his own hand, and the marginal remarks are also by him.⁹³ In Greaves' note 'Qānūn 52;48' is clearly taken from this manuscript.⁹⁴

In Pococke 379 there are some additions, in a later hand, from the geographical table of the *Zīj* of Ulugh Beg. Both Pococke manuscripts give the 'Aṭwāl 51;14' as noted in the margin of Greaves' notes on the coordinates of Alexandria (p.167 above). In contrast to Pococke 196, which has no annotations at all, Pococke 379 has marginal annotations by Greaves on almost every page, where he inserts corrections, from his own or Erpenius' MS. In the Erpenius MS, p.241, Greaves has underlined a few words with the marginal remark 'Desunt P', and in Pococke 379, f.44, l.5, the text ends at the point just before the underlined words. That detail, together with Greaves' abundant annotation, show that this is the Pococke MS referred to.

2.4 The MS Bodley Smith 15

This is a book in which Greaves recorded notes based on his wide range of reading of astronomical matters in the Persian and Arabic manuscripts, and

also notes on a range of other subjects. The book is very small, the pages measuring 134x55 mm, numbered 3-136. It may be dated no earlier than 1645.⁹⁵ Greaves' handwriting is exceptionally fine and neat, whether in Roman or Arabic script. Through these few pages one sees immediately Greaves' enthusiasm for so much material which he appreciated more than anyone else. He records here also a number of observations which have been examined above, sec.2.2.

He quotes from the manuscripts of Ibn al-Shāṭir, al-Qushjī, Shāh Khaljī, Chrysococces, Ulugh Beg, Naṣīr al-Dīn al-Ṭūsī, and from Kepler and the *Alphonsine Tables*.

On p.7 he lists all the mean longitudes which he has computed with complete accuracy from the Kepler's *Rudolphine Tables*,⁹⁶ giving these longitudes for four successive years 1644-7 Dec 31 (Gregorian) Noon, 10 degrees West of Kepler's meridian of Hven, the site of Tycho Brahe's observatory. This note is somewhat misleading because there is no indication that these longitudes are in fact computed from Kepler's tables, while on p.6 facing, he has given a number of parameters quoted from the Greek *Persian Syntaxis*, or equivalently the *Zij-i ilkhānī*. In fact he quotes the mean motions for one year, one month, one day, one hour, and this from Arabic, Persian and Greek. Some Greek terms are given alongside the Arabic. As remarked above, sec. 2.1, it certainly appears from this that he knew the *Zij-ilkhānī* in its Arabic version, and also recognised that the *Persian Syntaxis* is the Greek translation if it.

For example, on pp.47-8 he lists a number of Arabic and Persian astronomers, and matters related to them. Greaves writes this almost entirely in Arabic script: he extracts from Ibn Khallikān (from which of the many manuscripts one cannot say), and other sources, indicated by the marginal references to Ch (Khallikān), P (Pococke ?), B (Battānī or Bullialdus) and M (?).

al-Ma'mūn, Abū'l-'Abbās; duration of Caliphate:	
20y 5m 13d. age 49	d.217/832
al-Battānī,	d.317/929
observed Autumn Eq. A.H.882, 18d 13h 15' VIIE <Sept>	269/882
al-Farghānī	
al-Ṣūfī, observed Cor Leonis, according to Bullialdus ⁹⁷	325/936
Abū Ma'shar Ja'fār Muḥ. b. 'Umar al-Balkhī	d.272/885

Thābit b. Qurra b. Marwān	d.282/895
Ḥunain b. Ishāq Abū Ishāq	d.260/873
Ishāq al-Ṭabīb Abū Ya'qūb	d.299/911 or 298/910
Abu Naṣr al-Farābī died in Damascus	339/950
Ibn Sīna al-Rā'is Abū Ali al-Ḥusain b. Abdallāh died in Hamadan	428/1036
Abū'l Ḥassān 'Alī b. al-Imām al-Ḥāfiz b. Sa'id b. Yūnus he was a strong astronomer devoted to the science of observation; he made a useful Zij, called the Zij al-Hakimī	d.399/1008
Abū Rayhān Aḥmad b. Muḥ. al-Bīrūnī, observed the obliquity of the Zodiac to be 23;35 in A.H.385 using a circle of diameter 15 cubits; according to 'Alī b. Sulaymān al-Hashimī	385/995
Azerchel or Arzachel according to Abraham Judeus, that is Ibn Ezra, 190 years after al-Battānī, observed obliquity of the Zodiac 23;34 (Copernicus ⁹⁸)	482/1089
Prophatius Judaeus 230 years after Arzachel observed it to be	23;32 ⁹⁹
Abraham Judaeus, ipso teste, made in that time tables for Pisa ¹⁰⁰	549/1154
Naṣīr (al-ḥaqq wa'l-malla wa)al-Dīn Muḥ b. al-Ṭūsī sāhib Zij ilkhānī	660/1261
Ulugh Beg	d.853/1449
Khwānd Amīr	
Maḥmud Shāh Khaljī Sāhib k. Zij Jāmi'	866/1461
'Alī Qushjī sāhib Zij Jadīd Ulugh Beg, ipso teste	841/1437
Ibn al-Shāṭir observed the stars in the year A.H.764/1362-3, ipso teste	765/1363
Georgius Chrysococces wrote in Greek Persian tables: Scaliger	747/1346
K. Taqwīm al-Buldān l'il-Mulūk al-Mawayyad, Sāhib Ḥamāh (Abū'l-Fidā' Isma'il) written A.H.721, month Sha'bān	721/1321

The observation of Cor Leonis (α Leo) by al-Šūfī is noted by Bullialdus (1645), *Prolegomena* (p.15), Book V, cap.3 (pp.218, 224-5). He explains that he had obtained with the assistance of P. Gassendi a copy of the Latin text of al-Šūfī's catalogue,

In manus nostras aliquando venit liber MS cuius talis est titulus. *Incipit liber de locis stellarum fixarum cum imaginibus suis verificatis ab Ebennesophim Philosopho annis Arabum 325* id est anno Christi 936 Novemb.18. feria 7.¹⁰¹ liber ille MS. adservatur Forcalquierii apud eius oppidi Proprietorem: cuius mihi copia facta est procurante amico nostro Petro Gassendo, et per aliquod tempus hic Parisiis habuimus.

This copy is quite certainly that in the MS Paris Bibliothèque de l'Arsenal 1036, which contains a Latin version of al-Šūfī's catalogue.¹⁰² Fol.1 of that MS begins *Incipit liber de locis stellarum fixarum cum imaginibus suis verificatis ab Ebennesophim Philosopho annis Arabum 272*. On the facing page an owner of this manuscript has written, 'De Authore Ebennesophim seu Azophi vid. inter alios Bullialdus Astronom. Philolaic. Prolegom. p.15. et Operis lib.V. cap.3°. p. 224. Codex hic meus videtur antiquior illo qui penes Bullaldus fuit &c.' When this is coupled with Bullialdus' own remark, we can infer that it was written by Gassendi. The date 272 is incorrect and was certainly written over an earlier entry, perhaps 325 as Bullialdus gives, but which however is also wrong.¹⁰³ In fact the longitudes in the catalogue are referred by al-Šūfī to the beginning of the year 1276 of Alexander,¹⁰⁴ that is A.D.964 Oct 1, in the second half of A.H.353, A.H.352 complete. Perhaps through some confusion Bullialdus came to write 325 in error for 352.

One might have expected Ricci to have made some reference to al-Šūfī, since he depended so much on the Alphonsine tradition, as represented in the *Magna Compositio*¹⁰⁵ of Abraham Zacut. In fact he does so, but refers to him only as *albuassin*,¹⁰⁶ in *eius de locis stellarum fixarum libro*¹⁰⁷. He correctly associates with him the rate of precession 66 years per degree.

3. EDWARD BERNARD

3.1 Introduction

Edward Bernard (1638-1696) went to Oxford in 1655 as an undergraduate at St John's College, and then in 1658 became a fellow of the College. An orientalist by inclination, he also studied mathematics with John Wallis. From the beginning of his career, he devoted himself to the collection of data from a wide range of medieval sources, Latin and Arabic, following to that extent

the example of John Greaves, although he was not disposed, as Greaves had been, towards astronomical observation and travel. In 1668 he went to Leiden to examine the manuscripts collected by Scaliger, Warner and Golius. After returning to Oxford he was appointed in 1673 to be the Savilian Professor of Astronomy. In 1691 he resigned the Chair, and David Gregory was appointed to it.

In 1683 and 1696 he went to Leiden to purchase manuscripts on behalf of Archbishop Marsh of Dublin; on the first occasion those of Nicholas Heinsius' Library, and on the second, those from the estate of Golius. Modern scholars have the problem of identifying in the present Marsh collection in the Bodleian those manuscripts which Bernard purchased from Golius' estate. Bernard listed these manuscripts in his great Catalogue, but unfortunately this list does not stand in any particular correspondance with the later renumbering in the Marsh collection. I do not know whether these Golius manuscripts went at first to Marsh in Dublin, only to return to Oxford, or simply remained in Oxford with Bernard. I have attempted to identify those manuscripts which have a bearing on the mathematical sciences and geography, but was not able to identify every one of those listed in the Golius sale catalogue, which Bernard purchased.¹⁰⁸

Bernard's interest was concentrated heavily on a thorough exploration of the astronomical sources, picking out every sort of parameter, without much regard to a scientifically controlled application to the problems of astronomy. His sense of scientific control is much inferior to that shown by Greaves, even though one might expect him to have been influenced by the great astronomical figures of his time, Newton and Flamsteed. His principal publications in astronomy,¹⁰⁹ which are about to be discussed, show an indefatigable learning, but not much astronomical or historical insight. His greater contribution really was in his bringing the manuscripts of the Arabic Apollonius to Oxford, purchased in the Golius sale, which formed the basis of the very important translation by Gregory and Halley.

3.2 Positions of Fixed Stars

In 1684 Bernard¹¹⁰ addressed his account of the ancient positions of the fixed stars, in the first instance, to Robert Huntington, then Provost of Trinity College, Dublin, who communicated it to the Royal Society.¹¹¹ It is prefaced as follows,

During a number of days of the hardest winter of all in living memory, in Merton Library, where we knew you recently and in the past, I was greatly warmed, and to a certain extent alleviated your cruel absence, by the suitableness of the place: among your Arabic manuscripts (with more than 40 dealing with

celestial theory and observation)¹¹² I came upon the work of the splendid Persian Khoja Nasir al-Din Tusi in the study of the Ilkhanid Tables, and in particular various observations of the especially noteworthy fixed stars according to various astronomers, both latitudes (as they are called), as well as longitudes observed in the heaven, displayed in a short page. This table I convey partly from your own property, as you see, and partly from others. This does not seem to me indeed such a great thing to have done. But in truth, as our men conceive that there is some sense and value in the oriental astronomy, where this art first arose: or because they would have something more refined for our leisure set forth in the *Almagest* of the Arabs: or most of all as you dear man would have a not ignoble token of our friendship, but one which is distinctive and appropriate. Many reasonably trust the astronomy of the Orientals. The happiness, indeed, and the clarity of the regions where they observed: the size and accuracy of the instruments, such as many of us would not wish to believe that they had directed to the heavens. Besides, to the number of observers and assistants, ten-fold greater than are noted among the Greeks and Latins, add ten-fold more generous and powerful Princes, who gave expenses and celestial implements to men of good mind. Indeed Arabic astronomers found no fault in Cl. Ptolemy, Great Constructor of the celestial art: who sought minutes of time by water drops, by great sun-dials, and even (more wondrously) by vibrations of a hanging thread, long ago defined and measured: he also reflected on them expertly and accurately in a great undertaking of the human mind, on the revolution and period of the two great luminaries and of our orb, which ought not to be narrated in a letter. Praise to you, oldest of friends, praise to the Philosopher of Ireland. Given by me in your Library of the East in Oxford vi Kal. April (27 March) 1684.¹¹³

The 23 stars are listed in Table VI.

Table VI

1. θ Eridanus	2. β Cassiopeia
3. β Perseus	4. α Taurus
5. β Orion	6. α Auriga
7. α Orion	8. α Canis Maior
9. α Canis Minor	10. α Leo
11. α Virgo	12. α Bootes
13. α Scorpio	14. α Ophiucus
15. α Lyra	16. α Aquila
17. α Cygnus	18. α Pegasus
19. γ Pegasus	20. α Perseus
21. β Leo	22. α Piscis Austrinus
23. α Carina	

Bernard gives the following 17 sources for the coordinates of each of their positions at various dates.

1. Ptolemy. A.D. 137
2. Ali Abolcasim anno Christi 938
3. Abdorahmans Sophio anno Christi 964
4. Ebnolalamo an. Christi 980
5. Ex canonibus Hacimicis Johannidae Aegyptii anno Christi 996
6. Choagae Nasirodino Tusio in Tabulis Ilchanicis
anno Christi 1233
7. Ex Sultanicis Ologbeci anno Christi 1437
8. Abdolgalilo Segazio in Genethliacis anno Christi 1261
9. Ex Persicis Chrysococca anno Christi 1115
10. Ex Canonibus Persarum Pembrochianis anno Christi 1346,
Melixae 338
11. Ex Codice Arnoldino apud Gassendum pro anno Christi 1364
12. Ex Codicibus Illustrum virorum Savilii & Bodleis quasi pro anno Christi
750
13. Mohammedi Tizinio anno Christi 1533
14. Sahebodino Alepensi ad Ilchanicas pro annum 1436
15. Olaodino Sateridae in Tabulis Damascenis anno Christi 1480
16. Ex Tabulis Rodolphinis anno Christi 1600 ad Contemplationes Tychonis
Brahei
17. Ricciolo Bononiensi in Astronomia Reformata anno Christi 1660

In the following, the modern transcription of the name is given, together with a notice of the material, as far as I have identified it, from what was available to Bernard in Oxford or Leiden; he had visited Leiden twice before writing this article. The manuscripts are specified not only by the shelf mark, but by the entry in the appropriate Bodley Catalogue. Here I and II refer to the two parts of the old catalogue by Uri, and by Pusey and Nicol, respectively.

1. Ptolemy's *Almagest*
2. Abdallāh (or also, 'Alī) b. Amajūr, Abū'l-Qasim, al-Turkī.¹¹⁴
The source of the star list cannot be traced. No work of this astronomer is in the Bodley, and there is no indication by Suter or Sezgin V or VI of any star list in any MS. His observations are often cited by Ibn Yūnus.
3. Abdu'l-Rahman b. 'Umar, Abū'l-Ḥusain, al-Šūfī,¹¹⁵ 291/903-3. *Kitāb al-Šuwār al-Kawākib* (*Book of the fixed stars*). Hunt 212 (I,899; MS date 566/1171) ff.174, Pococke 257 (I,916) ff.210.

4. Ali b. al-Ḥusain, Abū'l-Qāsim al-'Alawī, Ibn al-A'lam, al-Sharīf al-Ḥuseini, fl.375/985.¹¹⁶ Quoted in the *Zij-i ilkhānī*, Hunt 143 (Ethé 1513), f.108.
5. 'Ali b. Abū Sa'id Abdu'l-Raḥmān b. Aḥmad b. Yūnus, Abū'l-Ḥasān, al-Ṣadafī, d. 347/958.¹¹⁷ Quoted in the *Zij-i ilkhānī*, Oxford Hunt. 143, f.108.
The only MS of the *Zij al-Ḥakimī* of Ibn Yūnus is in Leiden, Or.143, but in any case this is incomplete, and does not have a list of stars.
6. Muḥ. b. Muḥ. al-Ḥasān, Abū Ja'far, Naṣir al-Dīn al-Ṭūsī, 597/1201-672/1274.¹¹⁸ *Zij-i ilkhānī*, Oxford Hunt 143, f.107v. Date of list A.Y.600 complete, A.D.1232 Jan. This is of course the MS which Bernard refers to as 'your property' in the above letter to Huntington. The Arabic version of this *Zij*, Hunt 144 (I,897) was used in no.14 below
7. Ulugh Beg A.D.1437.¹¹⁹ *Zij-i Jadīd-i Sultānī*. Any or all of the following might have been used: Savile 46 (Ethé 2368, S.C. 6592); Pococke 226 (Nicoll Persian 70, Ethé 1517); Greaves 5 (Nicoll Persian 65, Ethé 1515); Marsh 396 (Golius MS Folio 27, Nicoll Persian 72, Ethé 1516), Bodley Or. 548 (Ethé 1518) St Johns 91, St Johns 151, St Johns 155. (There is in the Bodley another copy acquired recently: Pers.c.36, Ethé 2731)
8. Aḥmad b. Muḥ. b. 'Abdu'l-Jalīl, Abū Sa'id, al-Sijzi, fl.340/951-415/102.¹²⁰ *Tahwīl al-sinīn al-mawālīd* (*Revolution of the years of the world*) Hunt 437 (I,948), f.52v-53v.
9. An anonymous star list drawn up for A.H.509/A.D.1115, quoted by Ishmael Bullialdus, *Astronomia Philolaica*.¹²¹ The list is Kunitzsch Type I.¹²²
10. Chrysococces, *Persian Syntaxis*, Barocci 166, f.77v. Of the present volumes in the Barocci collection which contain the *Persian Syntaxis* (viz. 58, 63, 100, 166), only 166 contains a suitable star list; however this does not correspond exactly to the one given by Bernard. The Barocci collection was purchased by Earl of Pembroke in 1628. The list is Kunitzsch Type III.¹²³
11. Extracted from the anonymous 'Loca stellarum verificata Anno Christi 1364', in Gassendi.¹²⁴ Riccioli¹²⁵ quotes this list from Gassendi.
12. Not identifiable from this very vague information.
Or. 548 (Ethé 1518) St Johns 91, St Johns 151, St Johns 155. (There is
13. Muḥ. b. Muḥ. Abī Bakr al-Tizīnī, Abū 'Abdallāh, time keeper, Ummayyad Mosque, Damascus. fl.900/1494; sometimes 'al-Ḥalabī'.¹²⁶ *Jadwāl al-Mubārak* (Tables for the calendar, spherical astronomy and star coordinates) Selden superius 100 (I, 1039), f.25v-32r

14. Aḥmad b. Ibrāhīm b. Khalil al-Ḥalabī, Shihāb al-Dīn Abū'l-‘Abbās, Al-Muwaqqit (Time Keeper) of Ummayyad Mosque, Damascus, d.859/1455.¹²⁷ *Zij-i ilkhānī* (in Arabic) Hunt 144 (I,897), f.80-80v, omitting however nos.16-23 of Bernard's list.
15. ‘Alī b. Ibrāhīm b. Muḥ. al-Muṭ‘im al-Anṣārī, Abū'l-Ḥasan, Ibn al-Shāṭir 704/1304-777/1375.¹²⁸ *Zij al-Jadīd*. Arch.Seld A.30 (I,876; II,p.250, description), f.147v-148. The copy of this Zij in Hunt 306 (II,27) has no table of fixed stars. The date ‘1480’ cannot be explained. Greaves (1648(1)), p.45, gave 765/1363, in agreement with this copy.
16. Johannes Kepler *Rudolphine Tables*,¹²⁹ pars quarta, p.105.
17. Riccioli, *Astronomia Reformata*,¹³⁰ Liber IV, cap.xxi; p.260-2 for R.A. and declination, and pp.263-4 for longitude and latitude of the stars for A.D.1660 and 1700.

The series of 17 star lists is followed by a table quoted from one given by Tycho Brahe, or Riccioli, which gives the declinations of eight of these stars according to

Timocharis	295 B.C.,	Hipparchus	128 B.C.,
Ptolemy	137 A.D.,	Brahe	1600 A.D.

The first three are given by Ptolemy, *Almagest*, VII,3. References are also made to Aristyllis, Menelaos, and al-Battani. Bernard made use of various Latin sources, such as Digby 7 and 13, and knew for example of positions quoted by Walter of Evesham, and Walter of Vig<orniensis>, (again, Walter of Evesham ?)

In a final table, Bernard gives the rate of precession (giving as a rule the number of years per degree, and the annual motion) which he has found in the following authors.

1. Hipparchus, Ptolemy, Theon, Proclus, al-Farghānī	100	
2. Timocharis, who observed Spica in Era of Nabonassar 454, 466, Abdu'l Raḥmān Ṣāliḥī, ¹³¹ D. Petau	72	0;0,50
3. Ibn Yūnus	70.25	
4. Yaḥyā b. Abīmānṣūr Naṣīr al-Dīn al-Ṭūsī	70	0;0,51,26

Qutb al-Dīn al-Shirāzī		
Ulugh Beg		
Shah Cholji <Shāh Khālji>		
Abolphetacho (? Abu'l-Fath ¹³²)		
Ibn Ezra ¹³³		
Maimonides		
and some more recent		
5. Chrysococces ¹³⁴	68	0;0,52,23
English astronomers ca. A.D.1300		
6. Many Arabs, following Ma'mūn	66 2/3	
7. Abdur-Rahmān al-Šūfi ¹³⁵	66	0;0,54,33
Bahā' al-Dīn Chorcio ¹³⁶ (?)		
King Alphonso		
al-Battānī al-Raqqā		
Abdul-Jalil Sijzi		
Levi <ben Gerson>		
Zacut Judaeus		
a few observers of Marāghah		
8. Copernicus	ca 71	50;12,5
Maestlin		
their followers		
9. a few following Chorcio ¹³⁷		0;0,54
10. Brahe	obliquity 23;30	70 7/12
0;0;51		
Kepler		
Bullialdus		
11. Rongomontanus	72 1/3	0;0,49,54
12. Gassendi	70 1/3	0;0,51,19,24
13. Riccioli	obliquity 3;30,20	71,19 1/2 days
0;0,50,40		
14. Ourselves;	71, 9 2/3 mths	0;0,50,9 1/4
Egyptorum Hierophantis		

These lists of stellar coordinates and rates of precession are given without comment, as if Bernard had little notion of how they might be used, either for the history of astronomy, or for contemporary research. He passes such information on to serious astronomers such as Flamsteed, but one cannot but be disappointed to find that Bernard himself asks no historical or astronomical questions.

Bernard's habit of collecting data is shown in a large and very remarkable

table in Bodley MS Lat.misc.e.12, f.94v-96, where he presented an immense number of parameters drawn from all his sources. There is a certain amount of overlap with the above list.

3.3 The obliquity of the ecliptic

Bernard¹³⁸ examined many sources in his search for the many values of the obliquity which had been proposed by astronomers over the centuries. There had for some time been a debate as to whether the obliquity decreased, and if so, whether it decreased in a purely linear way, or with an oscillatory component.

His paper in the *Philosophical Transactions of the Royal Society* is in the form of a letter (in Latin) to Flamsteed, dated Oxford Aug.14 1681.¹³⁹

Greek Sources

He first of all attempts to establish the value of the obliquity in the Greek period, and draws on many sources in a way that shows a certain disorientation among sources of very unequal value. He found it impossible to be critical.

Eratosthenes, Hipparchus, assumed $180 \times 11/83$, which is exactly 23;51,19,31,5. . . ., but approximated by Ptolemy as 23;51,20. Ricciolus (1665) is quoted for details, such as the difference between Ptolemy's and the exact value.

The 'Tabulae Chvresmice conditae post Christum 830', that is the Zij of al-Khwārizmī, A.D.830, uses the obliquity of the 'Alexandrians', 23;51. He cites MS Lat.D. Hattoni, now Auct.F.1.9., one of the few sources of this most important work of early islamic astronomy.¹⁴⁰ In Bernard's Catalogue¹⁴¹ it is the Hatton MS, no 112.

Pytheas of Marseille, 324 B.C., given by Riccioli as 23;52,41.

Aristarchus, 280 B.C., according to Savile, 23;51,20, Ptolemy's value, but according to Riccioli, 23;30.

Strabo, 30 A.D., one fifteenth of the circle, 24;0.

A number of others also use 24, Geminus (*Elementa Astronomia*, Ch.4), Tattius (Ch.26), Proclus, the Indians, astrologers, the Arab Noddam,¹⁴² Abraham ibn Ezra,¹⁴³ etc.

Ptolemy, always industrious, using the circular ring called *krikos*, and the

plinth <a meridian quadrant>, Almagest I,12, ascertained very nearly the same as Eratosthenes, 23;51,20. For, the distance between the tropics varied between $47 \frac{2}{3}$ and $47 \frac{3}{4}$, but he took 47;42,40, whose half is 23;51,20. It is not surprising that Bernard accepts Ptolemy's own evidence, although one would not do so now.

Theon in the Handy Tables for simplicity disregarded the seconds.

Pappus Alexandrinus, 390 A.D. 23;35, according to Riccioli 23;30.

Arabic And Persian Sources

In this section the various values of the obliquity ascertained by Arabic and Persian authors are listed, and with each value I group the sources collected by Bernard, to which I add such identification as is now possible. The difficulties of tracing his sources are considerable, as one may see, for example, from the opening paragraph,

Almamon Princeps, A.Christi 825. Hegirae 210. 23.35. Grav. p.44. ex Ebn-Shatir Damasceno, MS. Sel. adsistentibus ei plurimis Astronomis. Ita etiam refert Abenesdras MS. Lat. in Archivis Digbeanis. Insuper Astronomus incertus in Arch. Seld. affirmat Iahia Ebn Abimansur cum multis aliis Philosophis, tempore Almamonis λόχωσιν experimento bi'l-qiyās al-Mumtaḥan deprehendisse 23,35 .

Al-Ma'mūn 210/825

Greaves¹⁴⁴ cites the Zij of Ibn al-Shāṭir, Bodley MS Selden.A.30. In that MS it is recorded that Yahyā b. Abī Maṣṣūr, with many others at the time of al-Ma'mūn, 'bi'l-qiyās al-mumtaḥan' (by the measurement of the <authors> of the Verified <Zij>), found 23;35. Lastly he mentions al-Farghānī's attribution of this obliquity to al-Ma'mūn.¹⁴⁵

In connection with al-Ma'mūn, and elsewhere, he refers to Al Noddam in commentariis suis ad astronomica Hosein Nisaburiensis. This author is Ḥasan b. Muḥ. b. Ḥusain al-Nisabūrī, Nizām al-Dīn,¹⁴⁶ although Bernard has presented the name in an odd way. The work in question here is his commentary on the Tadhkira of Naṣīr al-Dīn al-Ṭūsī, the Tauḍīḥ al-Tadhkira, which Bernard consults in a MS in St John's College. In his great Catalogue Bernard lists this as Commentarius in Elementa Astronomicae, Arabice.¹⁴⁷ In this MS, in commenting on a passage of al-Ṭūsī's on the subject of obliquity, Nizām al-Dīn gives a number of historical values of the obliquity, listed in Table VII.¹⁴⁸

Table VII

Ptolemy, Hipparchus	23;51, 20
al-Ma'mūn Banū Mūsā in Baghdād	23;35
Abū'l-Husain b. al-Šūfī in Shirāzī	each
al-Battānī in Raqqa	slightly
Abū'l-Wafā' al-Buzjānī in Baghdād	less than
Abu Ḥamid al-Saghānī in Baghdād	23;35
Ja'far al-Khāzin with	
Abū'-Faḍl al-Harāwī, in Rayy	
Abū Maḥmūd al-Khujandī	23;32, 21
al-Ṭūsī	23; 30

Ibn Ezra

Bodley MS Digby 40,

The text is ff.51-88v, *Cognitum est corpus solare*. This is based on Ibn Ezra's work on the Pisan tables, and is edited by Millas Vallicrosa.¹⁴⁹ Many texts are now known which have some bearing on the Pisan Tables.¹⁵⁰

Al-Battānī, Raqqa, A.H.269-317.

Observation dated variously, 880, 882, 890.

Sources, Ricciolus,¹⁵¹ Greaves,¹⁵² Savile; Abū'l-Farāj.¹⁵³

He used a long alidade, or Ptolemaic Parallactic Rule (*Almagest* V,12), to fix the interval between solstitial zenith distances as 47;10, that is 59;36-12;26, which implies the latitude of al-Raqqa as 36;1.

Bernard says however that al-Battānī took 35;0 as the latitude, and that Ulugh Beg took 36;10, Schickard¹⁵⁴ and Riccioli 36;0. Riccioli, Savile, Greaves and Abū'l-Farāj are used as authorities on al-Battānī.

Abdu'l Raḥmān al-Šūfī.

The source is not given, but must be 'Noddam', as noted above.

Abu'l-Wafā' al-Buzjānī,¹⁵⁵ and Ibn Ḥamed Saghānī¹⁵⁶, 377/987.

Bernard gives no indication of the source, but it must be Nizām al-Dīn again.

Zīj-i Muġmal, Arabic, Arch.Selden

This is Arch. Selden A.12 (Ethé 1544, S.C.3145), fols. 38v-93v, which includes (f.50v) a table of declination based on the obliquity 23;35. The work is in Arabic, but presented with a Persian title page, following two Persian works in this manuscript.

Persian Tables of Chrysococces

As has been pointed out above, these were known from four Barocci manuscripts.

Al-Bīrūnī 385/995.

Abū'l-Farāj puts him in '463/1070'.¹⁵⁷ He used a quadrant of 15 foot radius. Obliquity from Greaves,¹⁵⁸ who used the MS of al-Bīrūnī, Bodley Or.516, (II, 370), possibly one of Bernard's manuscripts.

*Abū Ja'far al-Khāzin*¹⁵⁹ and his colleague *Abū'l-Faḍl al-Harwānī*,¹⁶⁰ A.D.970. At Edessa, they determined that the obliquity did not exceed 23;35, but was slightly less.

Al-Khāzin wrote a *Zij al-Safā'ih*,¹⁶¹ mentioned by al-Bīrūnī in his *Kitāb al-Taḥdīd*.¹⁶² According to al-Bīrūnī, in that work, The Wazīr Abū al-Faḍl ibn al-'Amīd,¹⁶³ prime minister of the Buwayhid Ruler Rukn al-Daula, ordered al-Khāzin to make a meridian observation of the Sun on A.H.349, Sha'bān 12 (A.D.960 Oct 6), and this is recorded in the *Zij*, at least according to the *Taḥdīd*.¹⁶⁴ The *Zij* is regarded by Suter, Sezgin and Kennedy, as no longer extant. According to the older Catalogue of the manuscripts in Leiden UL,¹⁶⁵ MS Or.14(13) is Maqālat 1 of the work by al-Khāzin, but Voorhoeve, in the recent handlist of Leiden manuscripts,¹⁶⁶ describes this as 'Anon. Treatise on two problems from *Zij al-Safā'ih*'. In another Leiden MS, Or 168(17), there is a text by Maṣṣūr b. 'Alī b. 'Irāq dealing with a problem in that *Zij*. Both these manuscripts were among those purchased for the Leiden Library by Golius, and might have provided Bernard with his information, but I have not had an opportunity to examine them. None of the manuscripts which Golius kept for himself, and which were eventually purchased by Bernard, contain any likely source for al-Khāzin.

Ismā'il Abū'l-Fidā', Prince of Ḥamā 711/1311.

'In his tables in the MS of St John's College, where he follows the authority of al-Ma'mūn'.

This is not the *Taqwīm al-Buldān* of Abū'l-Fidā', but another work in which Bernard took some interest. In his list of the manuscripts of St John's College, Bernard (1697) lists. 'Abaco 3° no. 1899, 67: Collatio mensium Arab. Coptic. Graec. & Judaic. Arabice. Item Tabulae Astronomicae Omadoddin Ismaelis Abulphedae'. This is now divided into two manuscripts of St John's College 155, 156. MS 156- given by Coxe as 156B-is the volume containing the tables supposed to be by Abū'l Fidā'. This work, entitled *al-Sirr al-Maktūm fī'l-'Amal bi'l-Zij al-manzūm*, includes to begin with a series of short paragraphs bearing on all the usual operations carried out with an astronomical handbook (*zīj*). This much, of which Bernard made a copy,¹⁶⁷ is followed

by tables of mean motions and equations. These formed part of some *zij*, but in fact the earlier text makes no reference to them. In these tables Bernard found a table of declination which provided him with the value 23;35 of the obliquity. The tables give mean motions calculated for the fifteenth century, but a closer analysis shows that the mean motions are taken from the late twelfth-century *zij* by al-Farīsī, the *Zij al-‘Alā’ī*, drawn up for the meridian through Shirwān. The present tables, with their radices for A.Y. 800, 900, 1000, are intimately related to the *Zij al-Mumtaḥan al-Muzaffarī*, an anonymous set of tables, with radices for A.Y. 700, 800, also derived from the *Zij al-‘Alā’ī*.¹⁶⁸ Thus Abū’l-Fidā’ is certainly not the source of the tables, although he may have included them in his work.

23;33,30

Almaeon ibn Almansoris, 1140.

Riccioli¹⁶⁹

Zarqala Hispanus: various dates are cited:

482/1089: Greaves.¹⁷⁰

1070: Riccioli.¹⁷¹

1075: Maestlin.¹⁷²

190 years after al-Battānī: Copernicus.¹⁷³

Thus in the MS of Merton College, the difference from Ptolemy is given as 0;17,30—that is, Ptolemy had 23;51.

23;33

Clavius,¹⁷⁴ Maestlin¹⁷⁵

23;32,21

Abū Maḥmūd al-Khujandī,¹⁷⁶ 382/992, at time of Faqr al-Daulat.

He used a sextant of radius 40 cubits, with scale divided clearly into minutes, found it to be less than any of his predecessors.

This is from Hunt 566 (I, 970), a work entitled ‘On the construction and use of the universal instrument <Astrolabe>’. Bernard quotes again ‘Noddam’, who said it had never been reported to be less than 23;33.

23;32

Prophatius Judaeus, 1300

On the date, Riccioli¹⁷⁷: 1303, and Maestlin¹⁷⁸ 230 years after Zarqala, according to Copernicus.¹⁷⁹

MS of Merton College.¹⁸⁰

23;31

Ibn al-Shāṭir of Damascus, 1363

He allowed for solar parallax taken in the horizon to be 2;59.

This is taken from Arch.Seld.sup.A.30.

23;30,17

Ulugh Beg 841/1437, with 'Ali Kūshjī and others

Taken with the greatest care and largest of instruments¹⁸¹: thus the manuscripts of St John's College¹⁸² and Savile's library¹⁸³ ('which has however 23;30,27').

23;30

Thābit b. Qurra, 289/901

Wrongly dated 1210 according to Riccioli¹⁸⁴

Khoja Naṣr al-Dīn al-Ṭūsī 668/1269.

The date according to Greaves¹⁸⁵ is 660/1261.

23;30 nearly

R. Moses ben Maimon, A.D.1174, in *Consecratio Calendarum*, the last chapter of sec.4.

This work forms part of the Mishnah Torah; the modern translation is by Gandz.¹⁸⁶

In his conclusion, he admits 'that scarcely half of the eastern astronomers, whose works are in the libraries of the University have been consulted by me, and I need more leisure. For there are the Bodleian Library, and also the libraries of Merton College, Huntington, and the Royal Collection in St James Palace,¹⁸⁷ and others in England'. He acknowledges the kind assistance of Thomas Streete (1621-1689). He supposes that the obliquity has always been the same, but that more recently with better instruments, the excessive values of the ancients have been corrected.

Bernard's work was used, naturally, by Flamsteed, and it appears in the Prolegomena to the second edition (1725) of the *Historia Coelestis*,¹⁸⁸

Arabes primo solarium motuum tabulas emendare, ideoque veram eclipticae obliquitatem invenire, conati sunt: eorumque determinationes secundum tempora successivas describam; quibus lectori liquido constabit, quod etiamsi ab antecessorum determinationibus aequae aberrarunt, gradatim tam veritas praevaluit, ac demum in eadem quantitate huius et nuperorum seculorum observationibus inventa, fuit stabilita.

In other words, he regarded the successive medieval determinations as simply tending, through improvements in observation, to converge to the true value, which he (Flamsteed) could determine more accurately than any of his predecessors. In this conclusion he agreed therefore with Bernard. His own

measurements gave 23;29, which he regarded as the same as that found by Tycho Brahe.

Roger Long in his *Astronomy*,¹⁸⁹ gave a list of determinations of the obliquity for the period B.C.320 - A.D.1730, and included 12 Arabic values, quoted from Flamsteed, and so indirectly from Bernard. Long, unlike Bernard and Flamsteed, accepted that there really had been a slow decrease.¹⁹⁰ The matter was soon put on a firm theoretical footing by Euler and other investigators, especially Laplace¹⁹¹ who also made use of Chinese measurements made in the thirteenth century. It was found that the change takes place as a result of a perturbation of the earth's orbit by all the other planets. This causes the obliquity to vary periodically, but with such an immense period, that throughout the history of astronomy, only a decrease has been observed. The view that the obliquity was subject to a periodic variation was indeed held by some Arabic astronomers, notably Ibrahīm ibn Sinān ibn Thābit (ca.900), Zarqāla (ca 1080),¹⁹² and of course also by Copernicus (1543), although the models invoked for its description assumed far shorter periods of oscillation.

Lalande,¹⁹³ writing on the secular diminution of the obliquity, reprinted from Bernard's paper the whole of the section dealing with Arabic and Persian sources. Lalande settled for a diminution of 30" per century. The modern estimate is 46".845 per century at the present time

3.4 Correspondance

More than Greaves, Bernard was in active contact with leading figures of his time, and these letters show that his knowledge of Arabic sources was widely appreciated.¹⁹⁴

The following passage,¹⁹⁵ in which Streete asks for Arabic observations, is placed between letters from Flamsteed to Bernard, dated 1682 Feb 25 and 1677 Jan 22. The remarks are clearly the source of the summary version given on p.61 of the same MS, where Collins, writing to Bernard, quotes Streete. This passage is not in Flamsteed's hand, but since Streete is the author, it may be in his hand.

Ancient observations Astronomical, the older the better, but since the time of Ptolemy, or not published (and wrought) by him.

Observations of those Conjunctions of the Planets with fixt Starres especially of Saturn and Venus; or those conjunctions of the planets amongst themselves, or applications of planets to fixt starres, chiefly if the planet and two fixt starres were offered in one right line bearing near north and south in the time when such observations were made, and such other circumstances. Observations of the Moons passing by fixt starres, so as her Eastern or Western edge or here center was in a right line with any two known starres (bearing north or south

from her) with the time of the Observation taken by the altitude of som (sic) known star, or by the altitude of the Moon, or their rising or setting etc; so as the time may be considered in, with the place where the Observation was made, viz: in or near what Citie, etc. Or any such Observations of Moon Compared with fixt starres or with the Planets, or of Saturn and Venus to fixt starres, or in conjunction with other - Planets, as are published by Ptolemy in his *Almagest*, but more faithfully related.

These things are very much to be desired, for without them there can never be any certaine limitation of the Middle Motions or true places of all the Planets and Starrs untill some hundreds of yeares after our time.

Catalogues of Fixt Starrs with the places of them limited unto any- year, unless by some such particular Observations as above, avail little. The Application of Moon to fixt Starrs at the time of the eclipse, as at the Beginning, Immersion, Emersion, or End of the Eclipse are of excellent use; chiefly if the Moon were very near some bright starre,, or in a right line with two fixt starres, as above-mentioned, with the place of Observation.

Also the Close Conjunction of Venus with fixt starres or her being in a right line with any two of them that bear either North or South from her, at or near the time of her greatest elongation from the Sun, are very usefull, for the limitation of the true Praecession of the Aequinox.

The following¹⁹⁶ is taken from a letter written by John Collins to Edward Bernard, 16 Mar 1670/71, in which he quotes this passage from Streete.

Ancient Observations are desired besides those related by Ptolemy, the older the better to witt

Of the appules of the Moone and Planets to fixed starres In those of the Moone the exact time by the rising setting or - Altitude of the Moone, or some starr will be requisite, with the Place viz in or neare what Citty the observation was made And if at the time of the beginning or end etc of a Lunar Eclipse it will be so much the better, Venus her neare conjunction with fixt starres etc, at or neare the time of her greatest Elongation from Sun and at other times Observations of Saturn his close Conjunctions etc with fixt starres and of Mercury he being within his greatest distance from Sun the nearer the Sun the better

If any such are in the Arabick Manuscripts the Arabick texts (with their translation into Latin) are desired without such the middle Motions cannot be certainly determined.'

The phrase 'appules of the Moone' is clearly equivalent to the phrase 'Moons passing by fixt starres', in the first letter quoted; this is the modern 'occultation'.

4. THE DISCOVERY OF THE LUNAR ACCELERATION

4.1 *Edmund Halley*

The researches which led to the establishing of the secular acceleration of the Moon began with a attempt by Edmund Halley (1656-1742)¹⁹⁷ to restore the correct readings in al-Battānī's account of eclipses which he had observed at al-Raqqā, in Syria, in the late ninth century. Halley begins his account by remarking that al-Battānī's observations fall midway between those of Ptolemy and his own time, and that he was the first to dare to correct Ptolemy. He realized the need to emend the two printed editions of al-Battānī's work, that is, those of Nürnberg (1573) and Bologna (1645). These were printed from some manuscripts of Plato of Tivoli's twelfth century translation, and naturally contained numerous errors, compounding those of the original Latin version with those of the manuscript tradition. It must be pointed out that this work included only the text of al-Battānī's *Zij*, and not the tables. The tables have not come down to us in any Latin version, although they, as well as the text, must certainly have been known in Plato's time.¹⁹⁸ We know the tables now through Nallino's edition of the unique Arabic MS of the Escorial Library.¹⁹⁹ Halley is led to admire the accuracy of al-Battānī's work through his determination of the Autumn Equinox. He knows the place of observation as Arractae or Alracca, on the Northern side of the Euphrates, already a ruin by the time of Abū'l-Fidā', although formerly celebrated. All the geographers agreed in placing it at a latitude of 36 degrees. He hopes to reconstitute al-Battānī's tables of the Sun and Moon, which had been determined for that meridian.

According to al-Battānī, in his ch. 27, the Autumn Equinox was found to occur at 4;45 hours before Sunrise in the year 1194 Dhu'l-Qarnain, Elūl 19. In the Julian calendar, this is A.D.882 Sep 18 13;15 hours after Noon. Combining this with Ptolemy's Autumn Equinox, A.D.139 Sep 25 19;0 hours after Noon, at Alexandria, he determines the year to be 365 days 5;46,24 hours, and the motion in 365 days to be 359;45,46,25, which follows directly from the interval

2043469 13;15/24 - 1772095 19;0/24 in 743 revolutions of the Sun

On this Halley comments, 'which results from the fact that Ptolemy, whom I would not say is much inferior to Hipparchus in skill and effort, was preferred in this case. Because, to be sure, we have now shown it is in no way possible to reconcile the equinox of Ptolemy with observations by others, one may believe they are fictitious rather than taken from the heavens.' Halley's position is thus made clear, regarding the much disputed question of whether Ptolemy's equinoctial 'observations' are to taken as real. It is astonishing to

find that even today people can be found who believe that Ptolemy actually fixed this equinoctial time by observation, rather than by computation from the parameters received from Hipparchus.²⁰⁰

In these chapters, al-Battānī does not explain that he has determined not only the rate of motion of the Sun (that is the length of the year), but also the radix of its mean longitude by the use of Ptolemy's observation. That is, the constant in the linear function of time was adjusted so that the Sun's true longitude, according to al-Battānī's model, is 180;0 on A.D.139 Sep 25 19;0 hours after Noon, at Alexandria.

In ch.28 al-Battānī determines the solar apogee and equation, after fixing the interval from Autumn to Spring equinoxes as 178 days, 14;30 hours, and from Spring to Autumn as 186 days 14;45 hours. In the same way the interval in the Spring quadrant, from Spring equinox to Summer solstice, is 93 days 14 hours. From these data, the Sun's eccentricity is 2;4,45,²⁰¹ when the radius is 60. The apogee at that time, A.D.882, is 88;17, with a motion of one degree in 66 Julian years, as al-Battānī shows in chs. 33, 51.

Once Halley has fixed the text of those chapters, he has the parameters used by al-Battānī for the motion of the Sun, including the radices, at the start of Christian years for the meridian of al-Raqqā, and so he can reconstruct that part of the missing tables. His results are reproduced here, along with the figures calculated from the tables as we know them. The dates refer to end of the preceeding year, so that '881', represents Noon 880 Dec 31, J.D.2042843. He presents his results in the following table, with which I give the positions derived from al-Battānī's tables, as known now from Nallino's edition. For example, the mean Sun in '881' is got by adding '1191 anni romanorum collecti', 342;48,50, to the motion in the months through to the end of Kanun I (December)', 301;36,34.²⁰²

Table VIII

Year	Reconstruction		Tables
	apogee	mean	Sun
881	2,22 ; 16, 5	9,14; 24, 42	9,14; 25, 24
882	2,22 ; 17, 0	9,14; 10, 28	9,14; 11, 10
883	2,22 ; 17, 55	9,14; 56, 14	9,13; 56, 56
891	2,22 ; 25, 12	9,14; 0, 42	9,14; 1, 24
901	2,22; 34, 19	9,14; 3, 52	9,14; 36, 34

Halley's determination of the mean Sun is too small by 42", except for the year 883, when he is in error by about a degree, evidently having calculated for 883 Jan.1 instead of 882 Dec 31. He gives at this point a list of emendations to the two printed texts, and these in fact agree well with the modern edition of the text.

Two solar and two lunar eclipses are studied by al-Battānī in ch.30, where

he assumes values of the mean lunar parameters, without ever explaining how he has determined them. It is certain, however, that he has fitted the mean moon so as to agree with Ptolemy's around A.D. 135. The discussion in ch.30, which Halley quotes in detail, is designed as a criticism of Ptolemy's model of the distances and sizes of the Sun and Moon, which affect the appearance of eclipses. Al-Battānī's four eclipses are as follows, with al-Battānī's comments regarding the consequences of Ptolemy's model.

Solar eclipses

891 Aug 8 1:00 p.m. al-Raqqā 1; 0 hour too early

901 Jan 23 8;20 a.m. Antioch 2; 0 hours too late

Lunar eclipses

883 Jul 23 8:00 p.m. al-Raqqā 0;45 hour too early

901 Aug 2 15:20 p.m. Antioch 0;50 hour too early

The times refer to the maximum eclipse, and are in unequal hours at al-Raqqā or Antioch.

After studying al-Battānī's calculations of four eclipses, Halley evidently hoped to determine, as he had for the Sun, the mean parameters of the Moon, its apogee, and its node, so as to reconstruct that part also of the missing tables. However, he says of the printed text of Plato's translation that

one can discern as many errors as true values, so that the emendations would hardly be an easy matter. Although I would not be seen to presume to alter them in the sense of corrections, it is useful to get the radices of the mean motions of the Moon, Apogee and Node, such as al-Battānī himself took in his calculations, and we consider the matter in this way, as anyone might.

He then gives his reconstruction as follows (Table IX) in which I add the values calculated from the known tables.

Table IX

	Reconstruction	Tables				
	Year	mean node	apogee	node	mean	apogee
881	7, 27; 29	3, 1; 33	5, 17; 25	7, 27; 38, 58	3, 1; 25, 53	5, 17; 24, 49
882	0, 6; 53	4, 12; 12, 30	4, 28; 5	7, 2, 6	4, 12; 5, 54	4, 28; 5, 12
883	4, 16; 16	5, 22; 52, 30	4, 8; 45	4, 16; 25, 14	5, 22; 45, 54	4, 8; 45, 35
891	3, 2; 42	4, 18; 25	11, 4; 1	3, 27; 51, 27	4, 18; 19, 19	1, 4; 2, 14
901	0, 11; 4	6, 5; 23	4, 20; 36	0, 11; 14, 31	6, 5; 19, 27	4, 20; 36, 27

The tables of the *Zij* actually give the lunar anomaly, but the apogee (mean - anomaly), which Halley calculated, is tabulated here. The mean Moon is too small by about 9', and the implied anomaly too small by about 17'. The node is generally correct to the nearest minute. The above error, in taking '883' as 883 Jan 1, is not repeated here.

In Schiaparelli's extensive detailed discussion²⁰³ of al-Battānī's work, which indeed takes account of the present paper of Halley, it is pointed out that the mean parameters of the Moon implied by al-Battānī's discussion of the eclipses are not in exact agreement with his tables. The discussion of the first eclipse, for example, apparently entails that the mean Moon at the time of maximum eclipse is 137;8,32, not 137;5,42 as would follow from the tables. Nevertheless these discrepancies do not fully account for the differences between Halley's radices and those implied by the tables. Halley does not give his analysis, and it is not a straightforward matter to reconstruct his steps.

In the course of his argument Halley assumes with al-Battānī that the difference between the meridians of Antioch and al-Raqqā is 0;15 hours, or 3;45 degrees, the true value being 2;53. In his conclusion he remarks

I would have wished to be able to obtain from one of the best equipped libraries of Europe an Arabic copy of al-Battānī, so as to be able to confirm our emendations; and I would appeal to those who know the language, since, at least as regards the observations, there is not much, and it is not difficult to compare the manuscripts and then communicate with us.

Halley in this paper does not discuss the question which eventually becomes important to him, whether the Moon's motion accelerates. That question arises first, for Halley at least, in a curious review which he wrote concerning reports from English travellers in the Middle East.²⁰⁴ He notes an observation at Aleppo showing that its latitude is 36;30 (modern 36;14), 'as it was observed, Anno 1680, by three several quadrants, in the presence of a curious gentleman, to whom I am obliged for this information.' He continues,

thereby we are assured, that the city of Aracta, wherein Albatani made the observations we have published in Numb. 204²⁰⁵ was without doubt, the same which is now called Racca on the Euphrates

The latitude thereof was observed by that Albatani with great accuratness, about eight hundred years since; and therefore I recommend it to all that are curious of such matters, to endeavour to get some good observations made at this place, to determine the height of the pole there, thereby to decide the controversie, whether there hath really been any change in the axis of the earth, in so long an interval; which some great authors, of late, have been willing to suppose. And if any curious traveller, or merchant residing there, would please to observe, with due care, the phases of the Moon's eclipses at Bagdat, Aleppo and Alexandria, thereby to determine their longitudes, they could not do the

science of astronomy a greater service; for in and near these places were made all the observations whereby the middle motions of the Sun and Moon are limited: and I could then pronounce in what proportion the Moon's motion does accelerate; which that it does, I think I can demonstrate, and shall (God Willing) one day, make it appear to the publick.

That would appear, however, to be Halley's last word on the subject, either in print or in the manuscripts which I have seen.

4.2 Richard Dunthorne

Richard Dunthorne (1711-1775) was a pupil and protege of Roger Long (1680-1770), the first to be appointed to the Lowndean Chair of Astronomy and Geometry in Cambridge. Dunthorne had spent some time in verifying Newton's theory of the Moon against a number of eclipse observations.²⁰⁶ He says that he compared 100 observed longitudes of the Moon, taken from Flamsteed's *Historia Coelestis* and from papers which appeared in the *Philosophical Transactions* of the Royal Society and in the *Memoirs* of the Royal Academy of Sciences [of Paris]. He next proceeded to examine the mean Moon over a long time base.²⁰⁷ This was done in order to see whether Halley's suspicion of the lunar acceleration was well founded. Having examined eclipses reported by Tycho Brahe, and earlier by Bernard Walter and Regiomontanus, and finding no clear evidence of acceleration, he turned to the eclipses reported by al-Battānī,

and found the computed places of the Moon in three of them considerably too forward: This if I could have depended upon the longitude of Aracta, would very much have confirmed me in this opinion, that the Moon's mean motion must have been swifter in some of the last centuries than the tables make it; though the differences between these observations, and the tables, are not uniform enough to be taken for a certain proof.

I could meet with no observations of eclipses to be at all depended upon between those of Regiomontanus and Albategnius, except two of the Sun and one of the Moon made at Cairo in Egypt, related in the *Prolegomena* to Tycho Brahe's *Historia Coelestis*, p. 34 . . . These eclipses are the more valuable, because they were observed in places the longitudes and latitudes whereof are determined by Monsieur Chazelles of the Royal Academy of Sciences, who was sent by the French King in in the year 1693, with proper instruments for the purpose.

Before taking up the eclipses observed at Cairo, he considers a solar eclipse recorded by Theon of Alexandria in his commentary on Book VI of Ptolemy's *Almagest*. This occurred on Jun 16, A.D. 364, quoted from the Basel edition of Theon's commentary on the *Almagest*.²⁰⁸ Theon's account occurs also in his *Commentary on the Handy Tables of Ptolemy*. Tihon²⁰⁹ gives an edition of the

latter, a reconstruction of Theon's calculation, and observes that Theon gives only these *calculations*, not an observational record.

The Prolegomena to Tycho Brahe which he mentions had been compiled by Albertus Curtius.²¹⁰ Brahe's own observations are preceded by a very long list of earlier ones compiled by Curtius himself. Among these are found quotations from the Zij of Ibn Yūnus which Curtius obtained from Wilhelm Schickhard, Professor of Mathematics and Languages at Tübingen. An Orientalist with an interest in Astronomy, he was the author of *Astroscopium....cum Tabella synoptica, ad faciliorem investigationem locorum planetarum*, Nordlingae, 1655.²¹¹ The Zij of Ibn Yūnus was known then, as now, only through one of Golius' manuscripts in Leiden.²¹² This incomplete copy has not been completely translated, only chapters 4 and 5, in which Ibn Yūnus relates in detail the work of his predecessors, as well as his own observations.²¹³ The three eclipses which Dunthorne used were observed by Ibn Yūnus himself, and are to be found in chapter 5.²¹⁴ The eclipses observed by Ibn Yūnus were²¹⁵

solar eclipse	A.D. 977	Dec	13	Thu	10;26
solar eclipse	A.D. 978	Jun	8	Sat	14;10
lunar eclipse	A.D. 979	May	14	Wed	18;24

For the first two, Ibn Yūnus gives the altitude of the Sun at the beginning and end of the eclipse, and also its magnitude. The third eclipse however had already commenced by the time that it was first seen at Moonrise, so that the time of its commencement was unknown. From this account Dunthorne determines the times of start and finish for the two solar eclipses, but does not try to make use of the third. Schickard ends his extract with the remark

Hae tres observationes habitae sunt ab Ibn Junis, qui jussu Regis Abu-Haly Almanzor, sapientis, Aegyptio tunc Imperantis, rebus vacabat coelestibus. Hujus authoris tabulas habet Jac. Golius Professor Lugdun (qui mihi inde communicavit ista) in quibus plures aliae, sui et superioris aevi observationes extant. Locus observationis propinquus urbi Cahiro. Schickardus.

These three observations were made by Ibn Yūnus, by order of the King Abu-Haly Almanzor, a scholar, then ruling Egypt, who devoted himself to celestial matters. Jacobus Golius, who communicated them to me, is Professor in Leiden; he possesses the tables of this author in which there are several observations of his own and earlier times. The place of the observation is near the city of Cairo - Schickard.

Dunthorne devises an analysis of the eclipse geometry which will reveal to him the longitude interval between the Moon and Sun at the time of maximum eclipse for the given place of observation. He then calculates the same

quantity from his theory and records the difference D , where $D = \text{calculated interval} - \text{observed interval}$. He finds that for the three eclipses, D is respectively -0;4,16,0;7,36 and 0;8,45. These are rather small compared with values of D derived from other eclipses, and he concludes

The agreement there is between the two last of these differences in longitude, shews that the tables represent the mean motion of the moon's apogee very well for above 700 years, the Moon being very near her perigee at the time of one of those eclipses, and near her apogee at the time of the other.

In an effort to discover other values of D , he considers four more eclipses, including three recorded in Ptolemy's *Almagest*.

- | | | | |
|--------------------|------------|-----------------|---------------------------|
| 4. Bernard Walther | Nürnberg | A.D.1478 Jul 29 | too inaccurate to be used |
| 5. | Babylon | 382 B.C. Dec 12 | $D = -40''$ or $-50''$ |
| 6. Hipparchus | Alexandria | 202 B.C. Sep 22 | $D = -20''$ |
| 7. | Babylon | 721 B.C. Mar 19 | $D = -50''$ |

His account of the fifth. is erroneous in that he takes the 366th year of Nabonassar, 26 Thoth, as 313 B.C. Dec 22.

He summarises these results by noting that a constant acceleration would lead to the value of D increasing as the square of the time, and he fits his values of D by taking the coefficient to be $10''$ per century squared. D is taken to be zero at the time of Ibn Yünus, and of course also in his own time. He presents the resulting function D in the form of a table at century intervals,

Table X

years before Christ	error of Tables	years after Christ	error of Tables	years after Christ	error of Tables
700	- 56' 6"	100	- 16 0	900	2 40
600	- 49 50	200	- 1230	1000	3 30
500	- 44 0	300	- 9 20	1100	4 0
400	- 38 30	400	- 6 30	1200	4 10
300	- 33 20	500	- 4 0	1300	4 0
200	- 28 30	600	- 1 50	1400	3 30
100	- 24 0	700	0 0	1500	2 40
0	- 19 50	800	+ 1 30	1600	1 30
				1700	0 0

We may represent the function by the expression

$$D = -0;19,50 + 0;4 (Y/100) - 0;0,10 (Y/100)^2$$

where Y is the year number. The coefficient $0;0,10$ is the important part, since

the other two coefficients depend on the choice of origin.

Dunthorne's value of 10" was the first of many such estimates, but it was nevertheless accurate, which is rather surprising, considering his meagre data. Meyer a few years later found 7", then later 9", and Lalande 10" again. The modern value is about 12".³⁶ This acceleration is the sum of a dynamical component, in other words resulting from gravitational theory, and a non-dynamical component.

The dynamical component was first successfully explained by Laplace as an effect induced by the secular change in the eccentricity of the earth's orbit due to perturbations by the planets, mainly the massive planet Jupiter; he found the value 11".¹³⁵ This was given in a paper communicated to the Académie des Sciences, 1787 Dec 19,²¹⁶ and also in his *Mécanique Céleste*.²¹⁷ Laplace believed that the agreement which he found between theory and observation ruled out the need for any further explanation. However he worked from an incomplete theoretical analysis, as was pointed out in 1853 by Adams, who showed that the true dynamical component was only about 6".¹¹ Since then, it has been accepted that there is a need for a non-dynamical (non-gravitational) component. This is at least partly the result of a slowing-down of the earth's spin, caused by tidal friction. Dunthorne's work is properly recognised by Lalande,²¹⁸ and is noted in turn by Laplace in his original paper, although in his *Mécanique Céleste*,²¹⁹ he refers instead to work by Alexis Bouvard,²²⁰ for a definitive investigation of the 'known ancient eclipses, and those extracted from the manuscript of Ibn Yūnus'. Of course the ancient and medieval records continue at the present time to be explored, in order to document as fully as possibly the continuing changes in the earth's spin.

5. JOHN WALLIS

Attempts to prove the fifth postulate of Euclid's *Elements*, Book I, are to be found throughout the history of Greek, Arabic and European mathematics until the late eighteenth century when it was realized that one could formulate geometry, or rather geometries, independently of it, that is the so-called non-Euclidean geometries. The thirteenth century Persian mathematician Naṣīr al-Dīn al-Ṭūsī, of Marāghah, included one such attempt in his Arabic translation of Euclid's *Elements*. This was printed in Rome in 1594 by the Medici Press.²²¹ The Latin version of al-Ṭūsī's proof appeared first of all in print in *Opera Mathematica* of John Wallis (1616-1703)²²² where he followed it with his own proof. These efforts of al-Ṭūsī and Wallis found their way into the European mathematical literature, and were eventually to influence the work of Girolamo Saccheri (1667-1733), whose own attempt really marked

the end of the long and fruitless search for a proof, for it was followed soon after by the discovery of the new geometries by Lobachevsky, Bolyai, and Gauss.²²³

In fact, however, Wallis gave the Latin version of al-Ṭūsī's proof many years earlier, when lecturing at Oxford. The extant copy²²⁴ includes, apart from many notes on a miscellany of topics, Wallis's lectures on the first six books of Euclid. The lectures, given once or twice a week (Wednesdays and Saturdays), are each dated, the first on Wednesday Dec 3, 1651, the last on Wednesday Oct 19, 1653. These lectures therefore came at the beginning of Wallis's career as Savilian Professor of Geometry, to which he was appointed on June 14, 1649, at the age of 32, before he had published any work. At the end of the lecture on Book I, Prop.29, given on 1652 Feb 4, he says²²⁵

Verum illud quod hic assumit Euclides ut Axioma seu Postulatum; contendunt multi propositionem esse demonstrabilem; Ejusque demonstrationem Ptolemeus olim (referente Proclus) et post illum Proclus, et ex Neoteriis Clavius aggressi sunt; atque etiam inter /38v/ Arabes, Anaritius quidam (referente Savilio) quem nondum mihi contigit videre; atque Nasaridinus, cujus Arabica Euclidis editio, Romae impressa, in bibliotheca Bodleiana conspicienda est. Hanc ultimam latinitate donatam (non sine auxilio Edw. Pococke, linguarum orientalium, Arabicae praesertim, summo periti) & reliquis omissis apponendam duxi. Priorem²²⁶ hos, apud Proclum et Clavium extant (Nostram ejusdem demonstrationem, vide pag. 175 <f. 94r>).

The next lecture begins

Praelectio 21a. Feb. 7. 1651/2 (Saturday)

Nasaradinus Arabs Euclidis Axioma 11^m (vel secundum alii, postulatum 5^m) inter prop.28 et 29 Euclidis, sic demonstrat.

Here the proof is given, ending on f.41r.

In the printed version the paragraph preceding the proof is revised to include a note that a certain Thomas Oliver had attempted a proof in 1604. Wallis, writing now after he had composed his own proof, says that he would like to compare his own proof to that of the Arabic writer, 'chiefly because Savile would have expected that of his Professor of geometry'. Then at the end of the proof, in the printed version, Wallis remarks that Pococke had shown him, in another Arabic manuscript, two other demonstrations, not differing very much from the above.

We have no reason to believe that Wallis had acquired any Arabic, and so we must assume that Pococke provided not merely assistance, but simply the whole translation from the printed text, which was available in the Bodleian Library. Wallis's own proof is given in the manuscript containing his lectures,²²⁷ where it is dated 1663, 'in publicis comitiorum habita'. In the

printed text the date is given as July 11, 1663. The omission of the month and day here is not the only indication that this manuscript gives a fair copy, not the very original, although apparently in Wallis's hand.

APPENDIX: JOHN SELDEN, JAMES USSHER, THOMAS HYDE

In his *De anno Civili* of 1644, John Selden (1584-1654)²²⁸ was concerned to fix the details of the Jewish calendar, and for this he drew on a Hebrew MS on the subject written by Eliah ben Moses.²²³ The only Arabic work which he made use of was the so-called Annals of Eutychius, a collection of extracts of variable quality by Sa'id ibn Bat'riq, covering events from 'the time of Adam' to the ninth century. Selden published extracts of the work and Pococke prepared an edition of the whole text, with a translation.²³⁰

James Ussher (1581-1656) published his *De Macedonum et Asianorum Anno Solari* in 1648; this work might be compared with Selden's *De Anno Civili*, and indeed among the later editions, the two appeared together as a single volume published in 1683 in Leiden.²³¹ Ussher displayed a great breadth of learning on the subject of the length of the year, showing a knowledge of many sources now quite likely to be ignored in spite of their value, for example Galen's Commentaries on the *Epidemics* and on other works of Hippocrates. Selden called him 'learned to a miracle', a high compliment coming from a man so assiduous and accomplished. In astronomical matters as always, Ussher made use of Greaves' information.²³²

In his discussion of the peculiar form of calendar known to classical authors as *Paraepagma*, such as the *Phaseis* of Geminus and Ptolemy, he refers to the sidereally fixed signs, and so to various views on the subject of precession,²³³

Hic enim, Hipparchi insistens vestigiis, centum annis in consequentia signorum per unum gradum stellas provehi censuit: quem septuaginta annorum spatio ab illis confici, R. Joshua Judaeus (in tractatu Thalmudico, Horayoth dicto) Alzuphi Arabs, Nassir-eddinus Tusinus et Ulugh-beigus Persae, multo rectius tradiderunt; ita ut annuus earum motus sit minut 0'.51".25' ".42" " qui item 'υπωματων (sic) sive apogaeorum, Solis, Saturni, Jovis, Martis, Veneris et Mercurii, in Tabulis Persicis manuscriptis (à Georgio Chrysococcā Graecē conversis) annuus motus esse statuitur.

The annual motion 0;51,25,42 amounts to 1 degree in 70 years, correctly attributed to al-Ṭūsī, but which is not correct for al-Ṣūfī, who assumed 66 years per degree. Bernard on the other hand knew the rate assumed by al-Ṣūfī, taken from the copy of his great star catalogue.²³⁴ *Horayoth* ('Decisions') is the title of a Talmudic tract, the eighth of the fourth order of the Babylonian Talmud, dealing with liability for erroneous decisions. The passage is in

section 10, and refers to a remark in a story in which R. Joshua says to R. Gamaliel, 'A star rises once in 70 years and misleads sailors'.²³⁵ Ussher's suggestion that this is a reference to precession is quite fanciful. Some people²³⁶ have supposed, that the 'star' in question was Halley's comet, which appeared in A.D.66, but that is no more plausible than a reference to precession. It was quite possibly just a manner of referring to a chance misfortune.

We have an important confirmation here, indeed the only printed source, of the point made earlier,²³⁷ that Ussher is aware that the Persian Tables of Naṣīr al-Dīn al-Ṭūsī were the source of the tables of Chrysococcus.

In 1665 Thomas Hyde (1636-1703) published a critical edition of the Star Catalogue of Ulugh Beg,²³⁸ to which he added the star list of al-Tizīnī.²³⁹ Hyde states in his Preface²⁴⁰ that he has used three Persian manuscripts, those of Pococke and Savile and one in St John's College. The first two are presumably Pococke 226 and Savile 46. There are now, however, two copies of this work in St John's College, both belonging to Archbishop Laud, numbered 91 (in Persian), 151 (in Arabic).²⁴¹ No 151 appears to be the one used by Hyde. In a note attached to No.91, we are told that there were (in St John's) two Persian copies. Indeed in Bernard's Catalogue for the College there are two Persian copies of the work given as Abaco 3° 22, 104, together with an Arabic version, Abaco 3° 103. We appear to have now in the College therefore one of the Persian copies known to Bernard and Hyde, and also the Arabic version listed by Bernard.²⁴² According to Birch²⁴³ Greaves had planned a similar work, and had 'left it in the hands of Archbishop Ussher'.

WORKS BY JOHN GREAVES

For convenience of reference we give here a list of Greaves' works. Parts marked a,b, etc. appeared bound together in the year stated, while distinct publications in the same year are distinguished as (1), (2), etc.

1646

Pyramidographia.

1647

A discourse on the Roman foot and denarius, from whence, as from two principles, the measures and weights used by the ancients may be deduced.

1648 (1)

a J. Bainbridge, *Canicularia.*

b *Una cum demonstratione ortus Sirii heliaci pro parallelo inferioris Aegypti.*

c *Insigniorum aliquot stellarum longitudo et latitudo ex astronomicis observationibus Ulugh Beigi Tamerlanis magni Nepotis.*

1648 (2)

Binae tabulae geographicae, una Nassir Eddini, altera Ulugh Beigi Tatari. Arab et lat.

1649

a *Elementa linguae Persicae.*

b Anonymous *Persa de siglis Arabum et Persarum astronomicis.*

1650 (1)

a *Epochae Celebriores, Astronomicis, Historicis, Chronologicis Chataiorum, Syro-Graecorum, Arabum, Persarum, Chorasmiarum, usitate, ex traditione Ulugh Beigi, Indiae citra extraque Gangem Principis.*

b *Chorasmiae et Mawaralnahre, hoc est regionum extra Fluvium Oxum descriptio ex tabulis Abulfedae Ismaelis, Principis, Hamah.*

1650 (2) *A description of the Grand Signor's Seraglio or Turkish Emperour's Court*, by Robert Withers, edited by J. Greaves.

1650 (3)

a *Astronomica quaedam ex traditione Shah Cholgii Persae*

b & *una cum hypothesibus planetarum*, 1652

c *et cum excerptis quibusdam ex Alfergani elementis Astronomicis,*

d *et Ali Kushgii de terrae magnitudine & sphaerarum coelestium a terra distantiiis.*

POSTHUMOUS. These are listed by Birch (1737), pp. li-liv.

1659

Lemmata Archimedis apud Graecos et Latinos iam pridem desiderata, e vetusto codice manuscripto Arabico a J. G. traducta et nunc primum cum Arabum scholiis publicata. Included in Foster (1659)²⁴⁴

1677

Of the manner of hatching eggs at Cairo, *Phil. Trans.*, XX (1677), no. 137 p. 923.

1685

An account of the longitude and latitude of Constantinople and Rhodes; directed to the most reverend James Ussher. *Phil. Trans.*, XX (1685) no. 178.

1685

An account of some experiments for trying the force of great guns, *Phil. Trans.* XX (1685), no. 173, p. 1090.

1699

Reflexions on a report made by the Lord Treasurer Burleigh to the Lords of the Council . . . as concerning the needful reformation of the vulgar kalendar, for the civil years and days accompting of verifying according to the time truly spent, *Phil. Trans.* 21 (1699), no. 257.

NOTES

¹ Johann Fück, *Die arabischen Studien in Europa, bis in den Anfang des 20. Jahrhunderts*. (Leipzig, 1944, repr. 1955), pp. 47-53; Josée Balagna, *L'Imprimerie arabe en Occident (XVI^e, XVII^e et XVIII^e siècles)*. (Collection Islam et Occident, Maisonneuve & Larose, Paris, 1984), passim.

² A near contemporary list of at least some of these is given by Joh. H. Hottinger, *Promptuarium, sive Bibliotheca Orientalis* (Heidelberg, 1658), Appendix, 'Bibliothecarum aliquot Europaeorum, tam publicarum, quam privatum, ex quibus quid deinceps etiam praestari possit ab alii luculenter monstratur', pp. 18-24.

³ See below, sec. 2.2.

⁴ The tables were available in print only on their publication by Nallino from the unique Arabic MS in the Escorial, Carlo Alfonso Nallino, *Al-Battāni sive Albetenii Opus astronomicum* (Pubblicazioni del Reale Osservatorio di Brera in Milano, 40, 1899-1907). (Oxford, 1929).

⁵ A. E. Cowley, *A Concise Catalogue of the Hebrew Printed Books in the Bodleian Library*.

⁶ The copy in the British Library (Or.77.b.33) carries on the fly-leaf, p. iii, 'Empturus <two words lost> 1609 11 Fevruarius a Th Erpenio', showing that it was purchased from Erpenius on that date.

⁷ Gabriele Sionita, *Geographia Nubiensis id est Accuratissima totius orbis in septem climata divisi descriptio, continens praesertim exactam universae Asiae, & Africae, rerumque in iis hactenus incognitarum explicationem. Recens ex Arabico in latinum versa a Gabriele Sionita Syriarorum, & Arabicarum literarum Professore, atque Interprete Regio, & Ioanne Hesronitat, earundem Regio Interprete Maronitis* (Paris 1619).

⁸ Jacob Golius, *Muhammedis Fil. Ketiri Ferganensis Qui vulgo Alfraganus dicitur Elementa Astronomica, Arabice et Latine cum notis, etc* (Amsterdam 1669). This is reprinted, but without the valuable notes, as Ahmad ibn Muhammad ibn Kathir al-Farghani (Alfraganus) *Jawami' 'ilm al-nujum wa-usul al-harakat al-samawiya, herausgegeben als Elementa Astronomica von Jacob Golius*. (Nachdruck der Ausgabe Amsterdam 1669. Herausgegeben von Fuat Sezgin, Institut für Geschichte der Arabisch-Islamischen Wissenschaften an der Johann Wolfgang Goethe Universität, Frankfurt am Main, 1986).

⁹ There is a modern edition of this Hebrew work by F. Cantera Burgos, *Abraham ben Me'ir Ibn Ezra. The Beginning of Wisdom*, edition of the Old French version and an English translation of the Hebrew original by R. Levy. Edition of the Hebrew original by F. Cantera Burgos. (Johns Hopkins, 1939). However, Scaliger refers to this work for a passage which is certainly not to be found in it. The remarks which he quotes (p. 289) concerning the length of the tropical year according to al-Battāni, al-Šūfi and Zarqāla are similar to those found in Ibn Ezra's work on the *Fundamentals of Astronomical Tables*, *El libro de los fundamentos de las Tablas astronomicas de R. Abraham Ibn Ezra*, edición crítica, con introducción y notas por José Ma. Millás Vallicrosa (Madrid-Barcelona, 1947), p. 76. As the editor explains however, Ibn Ezra composed related works in Hebrew around the time when, according to Scaliger, his source was written, ie in 1148, and perhaps one of these was used by Scaliger.

¹⁰ Some of these, not necessarily including those known to Scaliger, are listed by Raymond Mercier, 'The Greek 'Persian Syntaxis' and the Zij-i ilkhāni', *Archives Internationales d'Histoire des Sciences*, 34 (1984), pp. 35-60.

¹¹ These are noted below, sec. 2.2.

¹² The classmark runs from Greaves 1 to Greaves 65, but not all are present; 45-50, 61 are absent, perhaps never sent by Thomas Greaves (1612-1676) also an Arabist, who was responsible for them as executor. In the Summary Catalogue the manuscripts are entered under nos. 3773-3837.

¹³ The first holder of the chair of astronomy in Oxford was John Bainbridge (1582-1643), a Cambridge graduate, MD (1614). Bainbridge had kept a school and studied astronomy in his spare time. He was appointed after the publication of his *An astronomical description of the late comet from the 18 November 1618 to the 16 of December following* (London, 1618). Savile

appointed him in 1619 to the chair which he had newly founded. In 1622 he began the study of Arabic. A work of greater interest is his *Canicularia*, published in 1648 by Greaves. The works published by Greaves are listed at the end of the chapter, referred to as Greaves (1648), etc.

¹⁴ The chair had been founded in 1619 by Henry Savile, Warden of Merton College.

¹⁵ These are listed at the end of the chapter.

¹⁶ Greaves (1647).

¹⁷ The yard standards of Henry VII and Elizabeth I were both of brass; R.D.Connor, *The weights and measures of England* (HMSO for the Science Museum, London, 1987), pp. 237-241, and are kept now in the Science Museum, London. The former is only 0.037 inches shorter than the present yard. The latter has been broken and mended, and is of uncertain length. According to Greaves the French foot was 1.068 times the English foot, 12.816 inches. The more correct ratio, 1.066, is quoted by Bernard from Picard's geodetic work; Edward Bernard, *De mensuris et ponderibus antiquiorum*, (London 1688), p. 256. Thus Greaves' English foot was apparently too short by 0.031 inches, nearly 1 mm. Later in 1742, measurements made for the Royal Society (Connor, p. 244) found that the Paris foot was 12.785 inches, intended to be accurate to 1/6000 of the foot; this makes the ratio 1.06542. In the nineteenth century the French foot is 1.06575 English feet, which differs by 1/3000 foot, somewhat outside the standard of precision hoped for with the older measurement; Friedrich Huitsch, *Griechische und Römische Metrologie*, Second edition, (Berlin, 1882), p. 23.

¹⁸ Greaves 1650(3) a, (1652) a.

¹⁹ Greaves (1650) 3 a.

²⁰ The MS which he used is now classed as Bodley MS Graves 6, ff.104.

²¹ The Muqaddama (Introduction) is in 36 secs., ff.1-65, followed by the first Bāb (Chapter I) in 22 secs., ff.65-104. According to the work itself, there was also a second Bāb and Khātimah (Appendix). His printed text gives almost all of the first section (*fasl*) of the Muqaddama, f.3,l.13 - f.14v,l.7; *fasl* 2 starts on f.15r,l.9.

²² Wright has written a brief note on the work; R. Ramsay Wright, 'Über die Schrift 'Astronomia quaedam' von Graves, mit einem Zusatz von Eilhard Wiedemann, Beiträge zur Geschichte der Naturwissenschaften LXXVII'. *Sitzungsberichte der Phys.-med. Sozietät zu Erlangen*, 58 (1926), pp. 381-6.

²³ Greaves (1649) a, 1650(3) d, (1652) d.

²⁴ Greaves (1650) (3) d.

²⁵ Heinrich Suter, *Die Mathematiker und Astronomen der Araber und ihre Werke* (Leipzig, 1900), sec.438; hereafter this work is referred to simply as Suter.

²⁶ Greaves 21 (S.C.3793). S.C. here and later refers to the *Summary Catalogue* of the Bodleian Library.

²⁷ Among other copies of the Tadhkira noted by H. Ethé, *Catalogue of the Persian, Turkish, Hindustāni, and Pushtū manuscripts in the Bodleian Library*, begun by E. Sachau, completed by H. Ethé and A. F. L. Beeston, 3 vols. (Oxford 1889-1954) which were in Oxford in Greaves' time, are Laud Or.313 and Bodley Or.101.

²⁸ Greaves (1649) a, p. 32.

²⁹ Tract on Astronomy, f.65r, line 10-11.

³⁰ The Persian unit farsākh is 3 Arabic miles, 5916 m.

³¹ Greaves (1647).

³² The manuscripts of Abū'l-Fidā' are discussed below in connection with Greaves' observations in Alexandria.

³³ These came to the Bodleian Library in 1629.

³⁴ Ethé, *Catalogue of the Persian, Turkish, Hindustāni, and Pushtū manuscripts in the Bodleian Library*, hereafter referred to simply as Ethé.

³⁵ Apart from the two manuscripts to be discussed, two others are listed by Edward Bernard, *Catalogus librorum manuscriptorum Angliae et Hiberniae in unum collecti*, (Oxford, 1697), Abaco tertio, no.103 'Ologbegi Tabulae Astronomicae, Arabicae', Abaco tertio, no.104 'Ejusdem Tanulae Astronomicae, Persice', but neither is listed in H. O. Coxe, *Catalogus*

codicum manuscriptorum qui in collegiis aulisque Oxoniensibus hodie adservantur, 2 vols. (Oxford, 1852). Of the two now in the College, Coxe 91, 151, both carry their former numbers, respectively, Abaco tertio 22, 66.

³⁶ Further remarks on the manuscripts of Ulugh Beg are to be found in the appendix on the edition of the whole catalogue by Hyde.

³⁷ Bodley MSS Hunt 143 and Hunt 144. Hunt 143 (Ethé, 1513, not in S.C.), is a copy of the original Persian work, while Hunt 144 (S.C.6278) is an Arabic translation.

³⁸ See below in sec. 2.2.

³⁹ Bodley MS Smith 15, p. 6; see sec.3.4 below.

⁴⁰ The Syntaxis is found in the Bodleian MSS, Barocci 58, 63, 100, 166.

⁴¹ Mercier, 'The Greek "*Persian Syntaxis*" and the Zij-i ilkhāni'.

⁴² All but Barocci 100 have the geographical table which is quoted by him for the latitude of Alexandria. The Greek geographical table in the Syntaxis is taken from the Zij al-Sanjari. See sec.3.3.

⁴³ Thomas Birch M.A. F.R.S, *Miscellaneous Works of Mr John Greaves, Professor of Astronomy in the University of Oxford: many of which are now first published. I Pyramidographia, II A Discourse of the Roman Foot and Denarius, III Tracts upon various subjects, IV A Description of the Grand Signor's Seraglio; to which are added I Reflections on the Pyramidographia written by an anonymous author, II A Dissertaion upon the Sacred cubit of the Jews, and the cubits of the several nations; in which from the dimensions of the greatest Egyptian pyramid, as taken by Mr Greaves, the antient cubit of Memphis is determined: translated from the Latin of Sir Isaac Newton. To the whole is prefix'd An historical and critical account of the Life and Writings of the Author*, 2 vols (London, 1737), p. liv. Birch's remark is to some extent confused, considering that the Syntaxis is a Greek work transcribed from Persian: 'He had prepared a translation of George Chrysoccoca (sic) out of Persian manuscripts into Greek, as he found that piece among the Baroccian manuscripts in the Bodleian Library; and a Table containing the Longitude and Latitude of twenty five of the most considerable fixed stars; and another Table, or Κανόνιον τοῦ μήκους καὶ πλάτους τῶν ἐπιστήμων πόλεων. These tables were published by *Ismael Bullialdus*, in the Appendix to his *Astronomia Philolaica* at Paris 1645. Dr Smith tells us that he had seen the various readings, noted down by Mr Greaves in the margin, collated with the printed copy.'

⁴⁴ Ismael Bullialdus (Boulliau), *Astronomia Philolaica*, <including *Tabulae Philolaica*, separately paginated> (Paris, 1645), *Tabulae Philolaicae*, pp. 211-232. We know that Greaves consulted this work; see below sec. 3.4.

⁴⁵ In his *Prolegomena*, p. 17, Bullialdus notes the observations of Bainbridge, but makes no mention of Greaves.

⁴⁶ Bodley MS Arch.Seld.A.30, ff.94v-139r.

⁴⁷ Bodley MS Arch.Seld.A.11.

⁴⁸ There is a modern edition and translation of this work, Fuad I. Haddad, et al., *The Book of the Reasons behind Astronomical tables (Kitāb fi 'ilal al-Zijāt)*. A facsimile reproduction of the unique Arabic text contained in the Bodleian MS Arch.Seld.A.11, with a translation by Fuad I. Haddad and E. S. Kennedy and a commentary by David Pingree and E.S.Kennedy (Scholars' Facsimiles & Reprints, Delmar, New York, 1981).

⁴⁹ Bodleian MS Smith 15, pp. 49-50.

⁵⁰ The position of the Sun at Noon is found by interpolation from Tuckerman's Tables, the obliquity, nutation, refraction, and the equation of time being calculated according to the *Explanatory Supplement to the Astronomical Ephemeris* (HMSO, London, 1974). In the case of the three stars, similarly, the declination has been determined with the aid of the formulae for precession and nutation given in the *Explanatory Supplement*, and refraction has been included.

⁵¹ The Julian day number.

⁵² Bodley MS Graves 2, f.iv.

⁵³ This is the only result calculated by Greaves.

⁵⁴ The '223' should apparently be 225, that is,

$$90 - (28 \frac{74}{300} + \frac{1}{600}) = 61 \frac{225}{300} + \frac{1}{600}$$

⁵⁵ Bodley MS Smith 15, p. 23.

⁵⁶ In his account of his measurements of the pyramids, Greaves (1646), p. ix, he notes that he used 'a radius of ten feet most accurately divided into 10,000 parts'. If this is the same 10-foot instrument, its interior angle would be $10,000/300 = 33.3$ degrees, too small to be likely.

⁵⁷ R. T. Gunther, 'The astrolabe of Queen Elizabeth', *Archaeologia* 86 (1937), pp. 65-72.

⁵⁸ R. T. Gunther, 'The first observatory instruments of the Savilian Professors at Oxford', *The Observatory* 60 (1937), pp. 190-7, Plates I, II.

⁵⁹ R. T. Gunther, 'The astrolabe of Queen Elizabeth', fig.1.

⁶⁰ R. T. Gunther, 'The great astrolabe and other scientific instruments of Humphrey Cole', *Archaeologia* 76 (1927), pp. 273-317, figs.2-5.

⁶¹ R. T. Gunther, 'The first observatory instruments of the Savilian Professors at Oxford'

⁶² R. T. Gunther, 'The first observatory instruments of the Savilian Professors at Oxford', figs. 1,2.

⁶³ Bodley Add.A.380, f.184. This manuscript is one of the Ussher collection, eight volumes (S.C. 27610-27617) presented to the Bodleian Library by his grandson James Tyrrell. Others in that group include some of the notes which he gathered in his extensive chronological studies, e.g. Bodley MS Add.C.297 (S.C. 27611).

⁶⁴ James Ussher, *De Macedonum et Asianorum anno solari dissertatio. cum Graecorum astronomorum paraemata, ad Macedonici et Juliani anni rationes accomodata* (London, 1648) provides the only printed reference to this point; see the note on Ussher in the Appendix.

⁶⁵ Sec. 2.1.

⁶⁶ In Table III the dates are given by Greaves for both the English and Gregorian calendars.

⁶⁷ The entry is, 'Marana in India Occidentia fine eclipsis 1634 altit. superioris marg. lunae 16;49 latitudo urbis Maranae 2;31,50 <recte 3;36 N 102;42 E>'.

In fact one of the three following eclipses of 1634 might be possible: March 14, 3 am, Moon (mag.10.6); March 29, 9 am, Sun (total at lat. 40); Sept 22, 3 pm, Sun (annular eclipse).

⁶⁸ Greaves quotes a detailed circumstantial account in Greek from Panagiota, whom I have not identified.

⁶⁹ Samuel Foster, *Miscellanies or Mathematical Lucubrations of Mr Samuel Foster, Sometime publike Professor of Astronomy in Gresham College in London* (London, 1659).

⁷⁰ 'P. Bertio' is mentioned in MS Greaves 13, f.25v, as editor of the Palatine MS of Ptolemy's Geography.

⁷¹ Bodley MS Add.A.380. In this most valuable record of Greaves' researches, the notes which he sent to Ussher occupy ff.153-187. In the rest we have: 188-191v, notes by Ussher on Chronology; 192v-193, Funeral Oration on Bainbridge by the Public Orator; several works by John Bainbridge: 194-197, De meridianorum sive longitudinorum differentiis inveniendis—Dissertatio; 198-201v, Antiprognoticon; 202-203v, Canicularia. Ad annum Canicularem et Periodum Sothiacam pertinet problema de ortu Canis Heliaco; 204-209, De Stella Veneris Diatriba; 210-212, Inventio lateris quadrati.

⁷² Bodley MS Add.A.380, f.153. In the following quotations from Greaves, phrases which he wrote in Arabic have been transcribed in the modern scientific fashion, and italicised. The underlining is his.

⁷³ Bodley MS Add.A.380, f.153v-4.

⁷⁴ Bodley MS Add.A.380, f.154-154v.

⁷⁵ Margin: *Almecina historia Saracenica*

⁷⁶ MS Bodley MS Add.A.380, 154v-155.

⁷⁷ Domenico Maria Novara.

⁷⁸ Ptolemy, *Geographia*, ed. C. F. A. Nobbe (Leipzig, 1845, repr. Hildesheim, 1966): head beacon 35;55; Ἱηλυσσόζ 36; Λίνδος 36.

⁷⁹ In the margin: 'in 37 degrees if it be not by a transposition in the MS of the numerical letters (lz) 37 for (lw) 36, which by reason of their similitude, are often confounded in Arabicke Manuscripts'.

Gilbert Gaulmin had annotated the summary of the geography of Idrisi, *Nuzhat al-mushtāq*

fi-ikhtirāq al-āfāq, a work used by Scaliger, as remarked in sec. 1; Balagna, *L'Imprimerie arabe en Occident (XVI^e, XVII^e et XVIII^e siècles)*, p. 40.

⁸⁰ [...] scored through. The illegible word, which one would very much like to read, is covered by ink, and could not be made out even with the aid of an UV source, or of backlighting.

⁸¹ MS Bodley MS Add.A.380, 155v-156.

⁸² *Géographie d'Aboulfeda*, translated from Arabic into French by Joseph Reinaud. Vol I, *Introduction générale à la géographie des orientaux*. Vol II.1 *Contenant la première moitié de la traduction du texte arabe*. Vol II.2 *Contenant la fin de la traduction du texte arabe et l'index générale* by S. Guyard (Paris, 1848-83), p. 112, 194.

⁸³ *Al-Qānūn 'l-Mas'ūdī, Canon Masudicus. An Encyclopaedia of Astronomical Sciences*, by Abū Rayhān Muḥammad b. Ahmad al-Bīrūnī, 3 vols, edited by the Osmania Oriental Publications Bureau (Hyderabad, India, 1954-6).

⁸⁴ *Das Kitāb Šīrat al-'Arḍ des Abū Ga'far Muḥammad ibn Mūsā al-Ḥuwārizmī*, Arabischer Text, edited by Hans von Mzik (Bibliothek arabischer Historiker und Geographen, Dritter Band, Leipzig, 1926).

⁸⁵ E. S. and M. H. Kennedy, *Geographical Coordinates of Localities from Islamic Sources* (Institut für Geschichte der Arabisch-Islamischen Wissenschaften an der Johann Wolfgang Goethe-Universität, Frankfurt am Main, 1987).

⁸⁶ Abū 'l-Ḥasan 'Alī b. Mūsā b. Sa'īd al-Maghribī, *Kitāb Baṣṭ al-Arḍ fi 'l-Ṭūl wa'l-'arḍ*, ed J. Vernet (Tetuan, 1958).

⁸⁷ Now the Bodley MS Greaves 2, ff.145.

⁸⁸ Suter, sec.432.

⁸⁹ Suter, either sec.168, Sahl b. Ibrāhīm b. Sahl b. Nūḥ Abū 'l-Qāsim (d.387/997), or sec.179, Muḥ. b. Aḥmad b. 'Ubaidallāh b. Sa'īd al-Umawī Abū Abdallāh (d.399/1009). In neither article is the work *Kashf al-qinā'* noted.

⁹⁰ Suter, sec.403, who does not list this Mukhtaṣar.

⁹¹ Suter, sec.445.

⁹² Cambridge, University Library, MS Dd.1.2.

⁹³ The date on p. 227, 'scriptus est hic liber anno Hegirae 721 id est Christi 1322', agreeing with the date in the Arabic colophon preceeding, Sha'bān 721 A.H., is that of the Erpenius' source.

⁹⁴ There have been reasons to doubt that this manuscript properly belonged to the collection of Erpenius manuscripts which came into the possession of the Library in 1632; J. C. T. Oates 'The manuscripts of Thomas Erpenius', *The Bibliographical Society of Australia and New Zealand, Occasional Papers* 1 (Melbourne, 1974); J. C. T. Oates, *Cambridge University Library. A History, Vol 1, From the Beginnings to the Copyright Act of Queen Anne*, (Cambridge, 1986), p. 163 s, 222. The doubt arose because the only extant list in the possession of the Library, included with other donor lists in the University Library MS Oo.7.52, does not include the work of Abū 'l-Fidā'. That list is the basis of the 'official' list of Erpenius manuscripts given by E. G. Brown, *A Catalogue of the Persian Manuscripts in the Library of the University of Cambridge* (Cambridge, 1896), pp. xii-xxii. Under the name 'Ismaelis Abulfidae Regis Hamathae Geographia' it is, however included in the lists of Erpenius manuscripts in G. J. Vossius, *Oratio in obitu Th. Erpenii. Item, Catalogus librorum Orientalium, qui vel manuscripti, vel editi in bibliotheca Erpeniana exstant* (Leiden, 1625), Hottinger, *Promptuarium, sive Bibliotheca Orientalis* and Bernard, *Catalogus librorum manuscriptorum*, who of course give them as lists of manuscripts belonging to the University Library. All doubt is now removed by the fact that in this manuscript, as noted above, there are remarks written in Greaves' quite distinctive hand, coupled with the fact that he says he used the Erpenius manuscript of this work. The donor list must therefore be defective.

⁹⁵ Greaves on p. 47 cites Bullialdus, *Astronomia Philolaica*.

⁹⁶ J. Kepler, *Tabulae Rudolphinae* (Ulm, 1627).

⁹⁷ The Latin version of the text is discussed below.

⁹⁸ N. Copernicus, *De Revolutionibus* (Nürnberg, 1543), Book III, secs 2 and 6. In fact the values 23;33 and 23;33,30 are found in the Toledan tables.

⁹⁹ Copernicus, *De Revolutionibus* III, 2 and 6. See the remark below. sec. 5.2, on this attribution.

¹⁰⁰ Abraham ibn Ezra prepared a set of tables for London and Pisa, apparently on the basis of an earlier zij by al-Šūfi; R. Mercier, 'The lost Zij of al-Sufi in the twelfth-century tables for London and Pisa' in *Lectures from the Conference on al-Šufi and Ibn al-Nafis* (Amman, Jordan, Oct. 1987), (Beirut, 1991).

¹⁰¹ The corresponding Latin date is correctly 936 Nov 19 Saturday (*feria* 7).

¹⁰² On this copy and Latin versions of this star catalogue see P. Kunitzsch, 'Šūfi Latinus', *Zeit. der Morg. Ges.* 115 (1965), pp. 65-74, (1986). In his 'Astronomer Abu'l-Ḥusayn al-Šufi and his Book of the Constellations', *Zeit für Gesch. de arab.-islam. Wiss.* 3 (1986), pp. 56-81, however, Kunitzsch expressed his belief that the manuscript from Forcalquier was lost; see p.80.

¹⁰³ There are in the margins of fol.1 a number of confused calculations concerning the date.

¹⁰⁴ *Suwar'ul-Kawākib of Abu'l-Husain 'Abdu'l-Rahmān al- Šūfi*, edited from the MS Bibliothèque Nationale, Paris, Arabe 5036 (Hyderabad-Deccan, India, 1954), p. 25.

¹⁰⁵ This work was never published in Zacut's lifetime, but was known to Ricci who frequently quotes from it. Modern editions of a portion of the Hebrew original and the contemporary Spanish version are available respectively in B. Cohn, 'Der Almanach perpetuum des Abraham Zacuto', *Schriften der Wissenschaftlichen Gesellschaft in Strassburg*, 32, Heft (Strassburg, 1918) and F. Cantera Burgos, *El Judío Salmantino Abraham Zacut* (Madrid, 1931).

¹⁰⁶ This indeed corresponds exactly to the Hebrew spelling in the manuscript preserved now in Lyon, one of those used by Cantera Burgos, *El Judío Salmantino Abraham Zacut*, pp. 244-5, 249. Clearly this is the manuscript which was used by Ricci.

¹⁰⁷ Augustinus Ricci, *De motu octavae sphaerae opus mathematica atque philosophia plenum*. (Trent, 1513), D5^r.

¹⁰⁸ J. J. Witkam of the University Library, Leiden, has been working on the determination of the Golius manuscripts in the Marsh collection.

¹⁰⁹ E. Bernard, 'The longitudes, latitudes, right ascensions and declinations of the chiefest fixt stars according to the best observers' in a letter from Mr Edward Bernard to the reverend and learned Dr Rob. Huntington Provost of Trinity College near Dublin in Ireland, *Phil. Trans. Roy. Soc.*, 14 (1684), pp. 567-576. E. Bernard, 'The observations of the ancients concerning the obliquity of the Zodiac', *Phil. Trans. Roy. Soc.*, 14 (1684), pp. 721-725.

¹¹⁰ Selden (1684a). Bernard's various tables of the 23 fixed stars are reproduced by John Flamsteed, *Historia Coelestis Britannica, or the British Catalogue of the Heavens*, 3 vols (London, 1725), Vol 3, Preface. These tables are reprinted also in *The Preface to John Flamsteed's Historia Coelestis Britannica, or the British Catalogue of the Heavens* (1725), edited and introduced by Allan Chapman, translation by Alison D. Johnson (National Maritime Museum, 1982), pp. 52-4.

¹¹¹ Bernard had himself been elected FRS in 1673; S. J. Rigaud *Correspondance of Scientific Men of the seventeenth century* (Oxford, 1841), vol. 1, p. 160.

¹¹² At present there are no manuscripts of Arabic scientific works in Merton College. Note that Savile had been Warden of Merton.

¹¹³ My translation.

¹¹⁴ Suter, sec. 99; F. Sezgin, *Geschichte des arabischen Schrifttums*, Bd. VI Astronomie (Leiden, 1978), p. 177; this work will be referred to as Sezgin VI.

¹¹⁵ Suter, sec.138.

¹¹⁶ Suter, sec. 137; Sezgin VI, p. 215.

¹¹⁷ Suter, sec. 178.

¹¹⁸ Suter, sec. 368.

¹¹⁹ Suter, sec. 438.

¹²⁰ Suter, sec. 185; Sezgin VI, p. 224 (no mention of this work)

¹²¹ Bullialdus, *Astronomia Philolaica*, pp. 225-6.

¹²² P. Kunitzsch, *Typen von Sternverzeichnissen in astronomischen Handschriften des*

zehnten bis vierzehnten Jahrhunderts (Wiesbaden, 1966).

¹²³ Kunitzsch *Typen*.

¹²⁴ *Proportio Gnomonis ad Solstitialem Umbram Observata Massiliae, anno 1636 Pro Wendelini Voto*, in P. Gassendi, *Institutio Astronomica* (The Hague, 1656).

¹²⁵ G. B. Riccioli, *Astronomiae Reformata*, 2 vols. (Bologna, 1665), pp. 216-7.

¹²⁶ Suter, sec.450.

¹²⁷ Suter, sec.434.

¹²⁸ Suter, sec.416.

¹²⁹ Kepler, *Tabulae Rudolphinae*. The reference is to the 'Catalogus stellarum fixarum mille, ex accuratis Tychonis Brahe observationibus et calculo ad annum incarnationis MDC completus', pp. 105-115, constituting *Pars Quarta*, the tabular part of Kepler's work.

¹³⁰ Riccioli, *Astronomiae Reformata*, Liber IV, cap. xxi, p. 260-2.

¹³¹ Possibly Suter, sec.500.

¹³² Perhaps Muh. b. Muh. Najm al-Din Abū'l-Fath al-Misrī, whose astronomical tables are included in Bodley MS Marsh 672 (1,944 and 995 - duplicate entry !); Suter, sec.460. He assumed a rate of precession of 1 degree in 70.25 years, following Ibn Yūnus; MS, f.145v.

¹³³ Millas Vallicrosa, *El libro de los fundamentos*, p. 78.

¹³⁴ Chrysococces, *Persian Syntaxis*, gives 70 years, but Bullialdus, *Astronomia Philolaica*, p. 225-6, gives 68 years in connection with an list of stars for the year 509/1115, cited as no.9 above, and unrelated of course to Chrysococces' *Syntaxis*.

¹³⁵ This is correctly the rate of precession assumed by al-Šūfī, as Bernard could learn from his *Star Catalogue*.

¹³⁶ Muh. b. Ahmad b. Abi Bishr, Abū Bakr, Behā al-Din, al-Kharaqi; Suter, sec.276.

¹³⁷ A reference to Greaves' Maestro Giorgio in Cairo; see sec.3.3.

¹³⁸ Edward Bernard, 'The observations of the ancients concerning the obliquity of the Zodiac', *Phil. Trans. Royal Society* 14 (1684), pp. 721-5.

¹³⁹ Flamsteed included some of this work of Bernard also, along with the work on obliquity, in the Preface to his *Historia Coelestis Britannica*, Flamsteed *Historia Coelestis Britannica*, vol.3; Chapman, *The Preface to John Flamsteed's Historia Coelestis*, pp. 49-51.

¹⁴⁰ For a survey of the manuscripts, see R. Mercier, 'Astronomical Tables in the Twelfth Century' in *Adelard of Bath, An English Scientist and Arabist of the early twelfth century*, edited by Charles Burnett (The Warburg Institute, London, 1987), pp. 87-118.

¹⁴¹ Bernard, *Catalogus librorum manuscriptorum*, Vol.I, Part I, p. 186.

¹⁴² See the discussion below on this commentary on the Tadhkira of Naṣir al-Din al-Ṭūsī.

¹⁴³ Millas Vallicrosa, *El libro de los fundamentos*, p. 92.

¹⁴⁴ Greaves (1648)(1), p. 44.

¹⁴⁵ Golius, *Muhammedis Fil. Ketiri Ferganensis*, Ch.V.

¹⁴⁶ Suter, sec.395. Among works kept in Leiden, Suter lists commentaries on the Tadhkira of Naṣir al-Din al-Ṭūsī, on his edition of the *Almagest*, and on his *Si faṣl* (a calendrical tract), in any one of which there may be such a reference.

¹⁴⁷ Oxford St John's MS 103, in the modern Catalogue of the College manuscripts, Coxe, *Catalogus codicum manuscriptorum*. It is included in Bernard *Catalogus librorum manuscriptorum*, Vol. I, Part II, No.1854, as 'Abaco 3° No.35'. It was owned firstly by Kenelm Digby, and then by Archbishop Laud. Since the work is not catalogued adequately by Coxe—no author or title being given—Suter does not list this among the known manuscripts of this work.

¹⁴⁸ The MS is not foliated, but this passage is on f.33v to 34.

¹⁴⁹ Millas Vallicrosa, *El libro de los fundamentos*, p. 73.

¹⁵⁰ Mercier, 'Astronomical Tables in the Twelfth Century', p. 108-112.

¹⁵¹ Riccioli, *Astronomiae Reformatae*, p. 20.

¹⁵² Greaves 1648 (1), p. 44.

¹⁵³ Edward Pococke, *Historia Compendiosa Dynastiaram Gregorio Abul-Pharajo*. Edited in Arabic and translated into Latin (Oxford, 1663), p. 191.

¹⁵⁴ Albert Curtius, *Historia Coelestis. Observationes Astronomicas varias ad historiam*

coelestium spectantes, [prepared by M. Maestlin, W. Schickhard, et al], preface by Albert Curtius (Ratisbon, 1672), p. xxx.

¹⁵⁵ Suter, sec.167.

¹⁵⁶ Suter, sec.143.

¹⁵⁷ *Historia Compendiosa Dynastiarum* . . . Gregorio Abul-Pharajo. Arabice edita et Latine Versa Edward Pococke (Oxford, 1663), p. 229; in fact he does not give the date, but only says *in these years*, after a remark about A.H.460.

¹⁵⁸ Greaves (1648) (1), p. 44.

¹⁵⁹ Suter, sec.124; Sezgin VI, pp. 189-190.

¹⁶⁰ Known only from al-Birūnī's *Tahdid*. See E. S. Kennedy, *A Commentary upon Birūnī's Kitāb Tahdīd al-Amākin, an 11th century Treatise on Mathematical Geography* (American University, Beirut, 1973), p. 41.

¹⁶¹ Not a *Zij* in fact in the usual sense of the term, but a work concerning the construction of the plates (*ṣafā'ih*) of the astrolabe.

¹⁶² *Al-Qānūn' al-Mas'ūdi*, p. 86.

¹⁶³ Suter, sec.125.

¹⁶⁴ Note also E. S. Kennedy, *A Commentary*.

¹⁶⁵ *Catalogus codicum arabicorum*. Vol.1, M. J. de Goeje, M. Th. Houtsma (Leiden, 1888); Vol.2, M. J. de Goeje, Th. W. Juynboll. (Leiden, 1907).

¹⁶⁶ P. Voorhoeve, *Handlist of Arabic Manuscripts in the Library of the University of Leiden* (Leiden, 1980).

¹⁶⁷ Now Bodley MS Or. 218 (II, 302).

¹⁶⁸ The *Zij al-Mumtaḥan al-Muẓaffarī* is found in Cambridge UL MS Gg 3.29 ff. 100v-138v. The Greek version of the *Zij al-'Alā'i* has been edited by D. Pingree, *The Astronomical Works of Gregory Chionides*. Vol.1. *Zij al-'Alā'i*. Part 1: Text, Translation, Commentary; Part 2: Tables (Corpus des Astronomes Byzantins, II,1. Amsterdam, 1985, 1986); see R. Mercier, Review of Pingree *op cit*, *Byz. Zeit.* 81 (1988), pp. 91-3, for a further discussion of the Arabic sources.

¹⁶⁹ Ricciolus, *Astronomiae Reformata*, p. 20.

¹⁷⁰ Greaves (1848)(1), p. 44.

¹⁷¹ Ricciolus, *Astronomiae Reformata*, p. 20.

¹⁷² Curtius, *Historia Coelestis*, p. xxxv.

¹⁷³ Copernicus, *De Revolutionibus*, III, 2 and 6; in fact Copernicus attributes to Zarqāla the value 23;34.

¹⁷⁴ In his commentary to Sacrobosco's *Sphere*, at least, Clavius assumed 23;30, Christopher Clavius, *In Sphaeram Sacro Bosco Commentarius* (St Gervase, 1608), p. 285.

¹⁷⁵ Maestlin Maestlin, *Epitome astronomiae, qua brevi explicatione omnia, tam ad sphericam quam tgeoricam eius partem pertinentia, . . . Ab autore denuo recognita ; additis insuper . . . brevibus ex doctrina triangulorum sphericorum praeceptis* (Tübingen, 1624), Book 4, part 3, lists values of the obliquity from various sources, as follows,

Aristarchus, Eratosthenes, Hipparchus, Ptolemaeus 23;51,20

Albategnius 23;35

Arzachel 23;34

Almeon 23;33

Prophatius Judaeus 23;32

Peurbachius 23;28

Copernicus 23;28,24.

¹⁷⁶ Suter, sec. 173.

¹⁷⁷ Riccioli, *Astronomiae Reformatae*, p. 20.

¹⁷⁸ Curtius, *Historia Coelestis*, p. xl.

¹⁷⁹ Copernicus, *De Revolutionibus*, III, 2 and 6. The text of the Almanach is available and is known in fact to be derived from the Toledan tables, so that the implied value of the obliquity is 23;33.

¹⁸⁰ Bernard, *Catalogus librorum manuscriptorum* does not include a copy of Prophatius'

Almanach among the Merton manuscripts.

- ¹⁸¹ Greaves (1648)(1) a, p. 44.
- ¹⁸² Manuscripts of the Zij of Ulugh Beg are mentioned in the note on Thomas Hyde.
- ¹⁸³ Bodley MS Savile 46.
- ¹⁸⁴ Riccioli, *Astronomiae Reformatae*, p. 20.
- ¹⁸⁵ Graves (1648)(1), p. 44.
- ¹⁸⁶ *The Code of Maimonides. Book Three, Treatise Eight. Sanctification of the New Moon*, translated S. Gandz, with commentary by O. Neugebauer (New Haven, 1967).
- ¹⁸⁷ Now the Royal Manuscripts in the British Library.
- ¹⁸⁸ Vol. 3 (pp. 26-9) of the second edition (1725), Flamsteed, *Historia Coelestis Britannica*.
- ¹⁸⁹ Roger Long, *Astronomy* (Cambridge, Vol.1, 1742; Vol. 2, 1764), vol. 1, p. 281.
- ¹⁹⁰ Long, *Astronomy*, vol.1, p. 286.
- ¹⁹¹ P. S. Laplace, *Traité de Mécanique Céleste* (Paris, An XI (1803)), Book 6, sec. 31.
- ¹⁹² On their contributions, see Mercier, 'Astronomical Tables in the Twelfth Century', p. 106.
- ¹⁹³ M. de la Lalande, 'Mémoire sur la diminution de l'obliquité de l'écliptique, et sur les conséquences qui en resultent' (*Mémoires de l'Académie Royale des Sciences*, Mémoire pour 1780, Paris, 1784), pp. 285-314.
- ¹⁹⁴ In Rigaud, *Correspondance*, however, only one letter of Bernard's is included, one sent to Collins, and having no bearing on oriental researches.
- ¹⁹⁵ Bodley MS Smith 45, p. 35.
- ¹⁹⁶ Bodley MS Smith 45, p. 61.
- ¹⁹⁷ Edmund Halley, 'Emendationes ac Notae in vetustas Albatenii Observationes Astronomicas, cum resitutione Tabularum Lunisolarium eiusdem Authoris', *Phil. Trans. Roy. Soc.*, 17 (1693), pp. 913-921.
- ¹⁹⁸ Mercier, 'Astronomical Tables in the Twelfth Century', p. 112-4.
- ¹⁹⁹ Nallino, *Al-Battāni sive Albetenii Opus astronomicum*.
- ²⁰⁰ R. Mercier, Review of *Ancient Planetary Observations and the Validity of Ephemeris time*, by R. R. Newton. *British J. History of Science*, 12 (1979), pp. 211-7.
- ²⁰¹ Thus the maximum equation is $\arcsin(2;4,45/60)=1;59,9$.
- ²⁰² Nallino, *Al-Battāni sive Albetenii Opus astronomicum*, vol.1 pp. 72, 4.
- ²⁰³ Nallino, *Al-Battāni sive Albetenii Opus astronomicum*, vol.1, p. 226 s.
- ²⁰⁴ Edmund Halley, 'Some Account of the Ancient State of Palmyra, with short Remarks upon Inscriptions found there', *Phil. Trans. Roy. Soc.* 19 (1695), pp. 160-175.
- ²⁰⁵ Edmund Halley, 'Emendationes ac Notae in vetustas Albatenii Observationes Astronomicas, cum resitutione Tabularum Lunisolarium eiusdem Authoris', *Phil. Trans. Roy. Soc.* 17 (1693) 913-921.
- ²⁰⁶ R. Dunthorne, *The Practical Astronomy of the Moon: or, New tables of the Moon's Motions, exactly constructed from Sir Isaac Newton's Theory, as published by Dr Gregory in his Astronomy. With precepts for computing the Place of the Moon, and eclipses of the Luminaries.* (Cambridge 1739).
- R. Dunthorne, 'A Letter from Mr Richard Dunthorne, to the Rev. Mr. Cha. Mason, F.R.S. and Woodwardian Professor of Nat. Hist. at Cambridge, concerning the Moon's Motion'. *Phil. Trans. Roy. Soc.* 44 (1747), pp. 412-420.
- ²⁰⁷ R. Dunthorne, 'A Letter from the Rev. Mr. Richard Dunthorne, to the Rev. Mr. Richard Mason, F.R.S. and Keeper of the Woodwardian Museum at Cambridge, concerning the Acceleration of the Moon'. *Phil. Trans. Roy. Soc.* 46 (1749), pp. 162-172.
- ²⁰⁸ *Claudii Ptolemaei Magnae Constructionis idest Perfectae caelestium motuum petractationis lib. XIII. Theonis Alexandrini in eosdem commentariorum lib. XI* (Basil, 1538), pp. 332-9.
- ²⁰⁹ Anne Tihon, 'Le calcul de l'éclipse de Soleil du 16 juin 364 p.C. et le "Petit Commentaire" de Theon' *Bull. de l'Inst. historique Belge de Rome*, 1976-7.
- ²¹⁰ Curtius, *Historia Coelestis*.
- ²¹¹ The eclipses are given by Schickhard in Curtius, *Historia Coelestis*, p. xxxiv.

²¹² Leiden University Library MS Or.143; a copy of this was made for Delambre, which is now in the Bibliothèque National, Paris, MS arabe 2495.

²¹³ J. J. A. Caussin de Perceval, 'Le livre de la grande table Hakémité', *Notices et Extraits de la Bibl. Nat.* (Paris, An XII, 1804).

²¹⁴ For the Arabic text and translation, Caussin 'Le livre de la grande table Hakémité', pp. 179-184.

²¹⁵ The times given are modern calculations for the maximum eclipse visible in Cairo.

²¹⁶ M de la Place, 'Sur l'équation séculaire de la lune', *Mémoires de l'Académie Royale des Sciences, Mémoire pour 1786, 1788*, pp. 235-264.

²¹⁷ Laplace, *Traité de Mécanique Céleste*, Book VII, sec. 23; he gives the value 31.424757 decimal seconds (400×100^2 decimal seconds = 360 degrees), that is 10.1816 sexagesimal seconds.

²¹⁸ M. de la Lande, 'Mémoire sur les équations séculaires. Et sur les moyens mouvemens du Soleil, de la Lune, de Saturne, de Jupiter & de Mars. Avec les observations de Tycho-Brahe faites sur Mars en 1593, tirées des manuscrits de cet auteur', *Mémoires de l'Académie Royale des Sciences (Mémoire pour 1757)*, 1762, pp. 411-470, p. 427.

²¹⁹ Laplace, *Traité de Mécanique Céleste*, Book 7, sec. 23.

²²⁰ I do not have the reference to Bouvard, which is not given by Laplace nor by R. Grant, *History of Physical Astronomy* (London, 1852).

²²¹ The Arabic text of the proof is on pp. 28-33, placed between Props. 28 and 29.

According to Adolph P. Youschkevitch, *Les Mathématiques Arabes (VIIIe-XVe siècle)*, (Paris, 1976), p. 183, there is a Latin translation of the whole of al-Ṭūsī's work: *Euclidis Elementorum libri tredecim studio Nasserredini*, Rome (1657). However after many fruitless searches in the libraries of Oxford, Cambridge and London, and in numerous catalogues of other libraries, I can hardly avoid the conclusion that it is a ghost. C. E. Sjöstedt, *Le Axiome de Paralleles de Euclides a Hilbert, Excerptes in facsimile ex le principal ovres orogonal e traduction in le lingue international auxiliari Interlingue, Introduction e commentarie de C. E. Sjöstedt* (Interlingue-Fundation, Uppsala, 1968), p. 69, noted this reference, given in earlier editions of Youschkevitch's history, but was also unable to find the work. Sjöstedt gave facsimiles of a great many tracts bearing on the history of the fifth postulate and non-Euclidean geometry, each accompanied by a translation into a new artificial Latin-based language 'Interlingue', and he reproduced the Arabic text of al-Ṭūsī's proof, as well as Wallis's own proof. Sjöstedt did not explain that Pococke was responsible for the Latin version of al-Ṭūsī's proof.

²²² John Wallis, *Opera Mathematica*, 3 vols (Oxford 1695, 1693, 1699), Vol.2, pp. 665-673.

²²³ Raymonde Cassinet, 'L'aventure de l'édition des Éléments d'Euclide en Arabe par la Société Typographie Medicis vers 1594', *Cahiers d'Histoire des Mathématiques de Toulouse*, 9 (1986), pp. 1-200, gives an excellent overview of the diffusion of the work of al-Ṭūsī.

²²⁴ Bodley MS Don. d 45. The manuscript came into the Bodley only in 1936, having been purchased at Sotheby's on June 25, 1936, and presented by the Friends of the Bodleian.

²²⁵ Bodley MS Don. d 45, f.38.

²²⁶ MS unclear.

²²⁷ Bodley MS Don. d 45, f.94r-96v.

²²⁸ The lives of Selden and Ussher are treated by John Aiken, *The lives of John Selden and Archbishop Ussher* (London, 1812) who however pays almost no attention to their scientific and oriental activities.

²²⁹ Elijah ben Moses Abba Delmedigo (ca 1460-93), a learned Jew who taught in Padua, and whose pupils included Pico della Mirandola. A search in A. Neubauer, *Catalogue of the Hebrew Manuscripts in the Bodleian Library and in the College Libraries of Oxford* (Oxford, 1886), does not reveal the calendrical work in question.

²³⁰ John Selden, *Eutychii Aegyptii, Patriarchae Orthodoxorum Alexandrini, . . . Ecclesiae suae origines. Ex eiusdem Arabico nunc primum typis edidit ac versiones et commentario auxit J. Seldenus. Arab. et Lat.* (London, 1642); *Contextio Gemmarum sive Eutychii Patriarchae Alexandrini Annalen*, edited J. Selden, translated into Latin by Edward Pococke (Oxford 1656).

The work and its sources have been studied recently by M. Breydy, *Études sur Sa'id ibn Batriq et ses sources*, CSCO 450 (Subsidia 69), (Louvain, 1983), who also prepared an edition and translation, *Das Annalenwerk des Eutychios von Alexandrien. Ausgewählte Geschichten und Legenden kompiliert von Sa'id ibn Batriq um 935 A.D.* herausgegeben von Michael Breydy, CSCO 471-2 (Scriptores Arabici 44-5, respectively text and translation), (Louvain 1985).

²³¹ *Joannes Seldenus de Anno Civili veterum Judaeorum & J.Usserius de Macedonum et Asianorum Anno Solari* (Leiden, 1683).

²³² As we have seen from the MS Add.A.380.

²³³ James Ussher, *De Macedonum et Asianorum anno solari dissertatio. cum Graecorum astronomorum paraepgmata, ad Macedonici et Juliani anni rationes accomodata* (London, 1648), p. 94.

²³⁴ See sec. 4.1 for manuscripts of the catalogue used by Bernard. Ussher's error no doubt derives from Ibn Ezra, whose work *Cognitum est corpus solare* was consulted by Greaves in Bodley MS Digby 40, ff.51-88v. The passage is 'Albateni vero probavit quod 66 annis uno gradu moventur; Azofi vero 70 annis uno gradu'; Millas Vallicrosa, *El libro de los fundamentos*, p. 78.

²³⁵ *Horayoth*, translated into English with notes, glossary and indices, by Israel W. Slotki (London, Soncino press, 1935), p. 71. Ussher's source was likely to have been Ricci, *de motu octavae sphaerae*, fol. A5^r, who cites this passage, taking it to be a reference to precession: De huiusmodi autem motu mentio facta est in talmuth in eo libro quem horaioth dicunt quod verbi nos ostensionum recte interpretari possumus: illic rabi Josue quibuslibet septuaginta annis ascendere sidus, quo quandoque contingit nautas decipi. Navigantes enim ea etate noctu stellarum situm intuebantur, qua observatione ad optatos portus applicare erudiebatur. Nondum enim usus magnetis maria traicientibus competus fuit. Hanc oppinionem rabi moyses maimonides <Maimonides> in suo libro misnetora <Mishna Torah>, hoc est reiterate legis, et aven ezra <Abraham Ibn Ezra> in libro taamim <Ta'amim> id est rationum sequuti sunt.

²³⁶ W. M. Feldman, *Rabbinical Mathematics and Astronomy* (New York, 1965), pp. 11, 216.

²³⁷ Sec. 2.2

²³⁸ *Tabulae long. ac lat. stellarum fixarum ex observatione Ulugh Beighi Tamerlanis Magni Nepotis... ex tribus invicem collatis manuscriptis Persicis jam primum luce ac Latio donavit & commentariis illustravit Thomas Hyde. In calce Libri accesserunt Mohammedis Tizini tabulae declinationem & reclarum ascensionum additur* (Oxford, 1665).

²³⁹ No.13 in the list of stars in sec. 4.1.

²⁴⁰ The Preface is not paginated, but this remark is in fact on p. 21 counted from the first page of the Preface.

²⁴¹ The descriptions in Bernard, *Catalogus librorum manuscriptorum* and in the Coxe, *Catalogus codicum manuscriptorum*, are quite unhelpful.

²⁴² Greaves' made use of four manuscripts of the work, as we see from the last line of his notes on the coordinates of Alexandria, see above p.167.

²⁴³ Birch M.A. F.R.S., *Miscellaneous Works of Mr John Greaves*, p. liv.

²⁴⁴ This collection of 15 propositions mainly on the geometry of the circle was here made available in Latin for the first time by Greaves. The Greek text is not extant. A modern translation (into Latin) is *Archimedis opera omnia cum commentariis Eutochii*, ed I.L.Heiberg, revised by E. S. Stamatis, 4 vols (Teubner: Stuttgart, 1972) II, 510-525. F. Sezgin, *Geschichte des arabischen Schriftums*, Bd. V Mathematik (Leiden, 1974), p. 131-133, 348, who does not mention this early printing, but discusses the tradition of the work and the commentary on it by al-Nasawi.

GEORGE MOLLAND

THE LIMITED LURE OF ARABIC MATHEMATICS

A cursory glance at biographical notices of prominent seventeenth-century British mathematicians quickly reveals that a surprisingly high number of them knew Arabic, and it is natural to seek a causal connection. In the case of mathematical astronomy this is easy, for much effort was devoted to the publication and translation of Arabic astronomical works, especially tables. But for pure mathematics the situation is less clearcut. There was, for instance, substantial discussion of 'Alhazen's Problem', which had been formulated and solved by Ibn al-Haytham (Alhazen to the Latins) in his *Kitāb al-Manāẓir*, and this was published in Latin translation in the sixteenth century. 'With the eye and visible object unequally distant from the centre of a convex spherical mirror, to find the point of reflection'.¹ But in the seventeenth century the Arabic connection was basically fortuitous, and the emphasis was on providing simpler and more elegant solutions of a problem whose origins were only relevant for giving it a name.²

Again, John Wallis thought it worthwhile to publish, in a Latin translation by Pococke, an attempt by Nāṣir al-Dīn al-Ṭūsī to prove Euclid's notorious fifth postulate, the postulate of parallels: 'That, if a straight line falling on two straight lines make the interior angles on the same side less than two right angles, the two straight lines, if produced indefinitely, meet on that side on which are the angles less than two right angles'.³ To many this seemed far less self-evident than the other postulates and accordingly susceptible of geometrical proof, but repeated failures to provide a satisfactory proof led in the nineteenth century to the creation of alternative 'Non-Euclidean' geometries. Wallis himself was still in the tradition of those who thought that they could prove the postulate, and he presented Nāṣir al-Dīn simply as another member of the chain of 'great men' who had tangled with the problem up until his own 'proof', which he published adjacently.

Wallis's Arabick interests in this case are rather more historical than mathematical, and in general he, like others of his time, was very conscious of the role that Arabic authors had played in the development of mathematics, and of its transmission to his own day. This is very clearly seen in the earlier sections of his *Treatise of Algebra, both Theoretical and Practical*, where he

was concerned to emphasise the contributions made by English mathematicians from the twelfth century onwards in bringing mathematical learning, both Greek and non-Greek, to European attention.

I find that divers of our own Nation, about the twelfth and thirteenth Century, (not satisfied with the Philosophy of the Schoolmen,) were inquisitive into the Arabic Language, and the Mathematical Learning therein contained. As Adelardus, (a Monk of Bath) whom Vossius placeth about the year 1130, who for that purpose travelled into Spain, Egypt, and Arabia; and (as Vossius tells us) translated Euclid (and some other Arabic Authors) out of Arabic into Latin.... And Robertus Retinensis (Robert of Reading) who travelling into Spain on the account of the Mathematics, did there translate the Alcoran out of Arabic into Latin, in the year 1143, . . . About the same time (or somewhat sooner) Gulielmus de Conchis (William Shelley) is said to have travelled into Spain to furnish himself with Arabic and Mathematical Learning; and brought from thence divers Arabic Books. And, soon after, Daniel Morlaeus (Morley), about the year 1180, made several journeys into Spain on the like account, where (at Toledo) Arabic and Mathematical Learning were in great request (brought thither by the Moors) which in other parts of Europe were scarce known. And these brought with them that kind of Learning into England very early, with store of Arabic books.⁴

Unsurprisingly not all the detail of Wallis's remarks will stand up to modern historical criticism, but there is little need to quarrel with the main lines of his account (except perhaps for its chauvinist overtones).

In this passage as elsewhere Wallis made much use of the scholarship presented in the *De universæ mathesios natura et constitutione* of Gerardus Johannes Vossius, who for a time had resided in England. Another Dutch historiographical influence came from the sixteenth-century mathematician and engineer Simon Stevin, who was concerned to play down Greek influences, and to emphasise the practicality of scientific pursuits. Accordingly Stevin believed in a pre-Greek Age of the Sages (*Wysentijt*), from which knowledge was diffused to both Greeks and Arabs. A particular sign of this was the use of algebra and the associated art of decimal numeration.

[Algebra] came to light a few years ago from Arabic books, which subject, from the writings they left, is seen not to be known to the Chaldeans, the Hebrews, the Greeks (for Diophantus is no ancient writer) or the Romans, all of whom were no arithmeticians worth the name. Considering also that they lacked the necessary instruments, viz. numerals, with the same tenth progression as the numbers have when pronounced, it was impossible for them; but they may have been arithmeticians of the kind who now count by laying out pennies or reckon with chalk marks, or the like. These numerals of the tenth progression have come to light again from Arabic books.⁵

Wallis reported Stevin's opinion,⁶ and was himself tempted towards a somewhat similar view, although he was careful to insist upon Greek

knowledge of algebra:

That it was in use of old among the Grecians, we need not doubt; but studiously concealed (by them) as a great Secret. Examples we have of it in Euclid, at least in Theo, upon him; who ascribes the invention of it (amongst them) to Plato. Other Examples we have of it in Pappus, and the effects of it in Archimedes, Apollonius, and others, though obscurely covered and disguised. But we have no professed Treatise of it (among them) ancients than that of Diophantus, first published (in Latin) by Xylander, and since (in Greek and Latin) by Bachetus, with divers Additions of his own; and Re-printed lately with some Additions of Monsieur Fermat.⁷

Nevertheless the way in which knowledge of algebra was transmitted owed very little to the Greeks, and Wallis seems inclined to locate Stevin's 'Age of the Sages' among the Indians:

It is not unlikely that the Arabs, who received from the Indians the Numeral Figures (which the Greeks knew not), did from them also receive the use of them, and many profound Speculations concerning them, which neither Latins nor Greeks did know, till that now of late we have learned them from thence. From the Indians also they might learn their Algebra, rather than from Diophantus (who only of the Greeks wrote of it, and he but late, and in a method very different from theirs:) For sure it is, they had a great deal of other good Learning beside what they had from the Greeks, and that very early. And the Saracens, when they were so careful as to have all the most considerable Greek Authors translated into Arabic to gain their Learning; it is not to be doubted, but they used the like industry to gain the Learning of the Persians, Indians, and other Orientals, whose language less differed from their own. And the name they gave it (*Al-gjabr W'al-mokabala*) seems to have no affinity with any Greek name; which yet they use in some measure to preserve, when they had it thence, as we see in the words *Al-magesti*, *Al-gorism*, and some others.⁸

Wallis's allusion to the derivation of the term 'algorism' is eccentric: it is now generally accepted, as it had been in the Middle Ages, that the name came from that of the ninth-century Arabic mathematician Muḥammad ibn Mūsā al-Khwārizmī, to whom Wallis refers (although without mentioning the cognomen al-Khwārizmī) as reputedly prominent in the history of algebra. In general though Wallis is careful with his etymologies, and will not, for instance, allow algebra to be named after the alchemist Geber, as some Renaissance scholars had suggested (although he does toy with the idea that Muḥammad ibn Mūsā may have been the same as the astronomer Geber). Instead, as we have seen, he draws attention (in his style of transliteration) to the fuller phrase *Al-gjabr W'al-mokabala*, which, he says, 'may signifie, the Art of Restitution and Comparing; or, the Art of Resolution and Equation'. Although there is still controversy about the exact meaning of the terms, this does not diverge too far from modern interpretations.⁹

Wallis and his contemporaries rightly stressed the significance of the Arabs in the development of methods of numerical computation and of algebra.

And Vossius tells us, (citing Stevinus to the same purpose) That the Greeks and Romans could not be perfect Arithmeticians, or good Algebraists, for that they wanted the Numeral Figures, which we had from the Arabs; without which, they were not able to express Decimal Periods. ... And Algebra (by what we have already said) seems to have come to us from the Arabs, at the same time, and together with the Numeral Figures.¹⁰

Once this emphasis had been made, there was not much more to be said, unless one were to embark on the kind of detailed historical investigation of Arabic mathematics that became the prerogative of later centuries. The situation was different with regard to Greek mathematics, and here paradoxically knowledge of the Arabic language became far more useful. This was because there were several works for which Greek exemplars were no longer extant, but of which Arabic translations existed. There was thus ample opportunity for continuing the twelfth-century tradition of mediating Greek learning to the West via Arabic.

In a very blurred way we have a sixteenth-century example of this when John Dee came across a Latin translation of a work *De superficierum divisionibus* of Machometus Bagdedinus (Muḥammad al-Baghdādī) and communicated it to Federico Commandino, who had it published. It was in fact heavily dependent on Euclid's lost work *De divisionibus figurarum*. An Arabic manuscript of this was discovered in the nineteenth century, but from Dee's time onwards it was suspected that Euclid had something to do with the Bagdedinus work, as when G. J. Vossius remarked that, 'It is also justly debated whether this be not a work of Euclid translated into Arabic.'¹¹ In the early seventeenth century Henry Briggs thought the Arabic version(s) of Euclid's *Elements* worth studying, for, commenting on the start of Arabic lectures in Oxford by Matthew Pasor, he expressed the hope that 'we shall have some here able to interpret our Arabic Euclide or any ordinarie booke written withe pointes',¹² although later in the century Isaac Barrow was to complain that the Arabs had distorted the text of Apollonius.¹³

The Savilian professors at Oxford had a particular propensity towards Arabic, and one of them, Edward Bernard, who held the Chair of Astronomy from 1673 to 1691, was especially important in promoting the recovery of Greek mathematics with the aid of Arabic texts. Already, in 1668, Bernard had visited Leiden to examine various manuscripts and especially the Arabic version of Apollonius of Perga's *Conics* that the very notable mathematician and orientalist Jakob Gool (Jacobus Golius), who died the previous year, had

acquired in his travels in the East.¹⁴ Apollonius had written what became the standard Greek work on conic sections. In his introduction he indicated that it comprised eight books, and that Pappus of Alexandria, who reported on several Greek mathematical works (many now lost), also described eight books,¹⁵ but only the first four now survive in Greek. Book VIII seems irretrievably lost, although both Ibn al-Haytham and Edmund Halley tried to restore it.¹⁶ By the seventeenth century, it was well known that Books V-VII were extant in Arabic. In 1661 a Latin translation of Books V-VII by Abraham Echellensis (from a heavily edited Arabic version) was published in collaboration with Giacomo Alfonso Borelli.¹⁷ In 1669, in apparent independence, another Latin translation was published at Kiel by Christian Ravius. Both these editions received criticism. For instance, Thomas Smith, the biographer of Bernard, remarked that, while Echellensis and Ravius were excellent Arabists, they were both feeble mathematicians.¹⁸ It therefore caused some minor excitement in Royal Society circles to hear that a new British edition was on the way. In early 1672 John Collins wrote to Henry Oldenburg, ‘... here we have in y^e Presse Horrox ... Dr Barrows Comment on y^e 4 first Bookes of Apollonius fitted for the Presse to which Mr Bernard will adde the later 3 out of the Arabick namely out of the Coppies of Beni Musa with the notes of Eutocius and Abdelmelech. . . .’¹⁹ And Oldenburg proceeded in his well-practised way to disseminate the information more widely.

Books I-IV of the *Conics* had been translated into Arabic by Hilāl al-Ḥimṣī, and Books V-VII by Thābit ibn Qurra, both in the ninth century A.D. These translations were then revised with additions by the Banū Mūsā (sons of Mūsā ibn Shākir). In the twelfth century A.D. a reworking of the treatise was produced by ‘Abd al-Malik al-Shirāzī.²⁰ Eutocius of Ascalon was a sixth-century Byzantine commentator on Apollonius and Archimedes. This should help to explain Collins’ otherwise perhaps puzzling remarks, but in fact the Barrow-Bernard edition never saw the light of day.²¹ This was possibly because Bernard, with the encouragement of John Fell, the Bishop of Oxford, was already contemplating a far more grandiose scheme, namely the publication in fourteen volumes of virtually all extant Greek mathematics. His bibliography for the project, later published by Thomas Smith, included a mass of supporting material, much of it in Arabic. The entry for Volume II, that on Apollonius, reads as follows:

I. The seven books of conics of Apollonius of Perga. The first four in Greek and Latin from the version of Federico Commandino, Bologna 1566, collated with the versions of Memmo and Maurolyco. In Greek from the manuscript codices of the Savilian library and the library of Leiden and the codex 103 of the most Christian king.²² Labbe, p. 271.

Adjoined by Eutocius's commentary, in Latin from the version of Commandino and in Greek from the codex in Arch. Pembr. 169.,²³ and by the notes of Dr Savile and others.

The three following books, namely 5, 6 and 7 (for the eighth was lost some time ago) in Arabic and Latin from the Arabic translation of Beni Musa, who modelled the Eutocian edition,²⁴ and a new Latin version, together with the notes of Abdolmelic the Arab, who reduced the seven books of Apollonius's Conics to a compendium, from Bodleian manuscript codices, and also the notes of the eminent mathematician Borelli and others, with figures and notes from the papers of the great Dr Gool. These together with the lemmata of Pappus.

The Arabic translation of Beni Musa from the codex of the Leiden library (which is also a copy of the best known manuscript in the catalogue of books of the late Dr Gool) has been transcribed. The Golian codex also displays the first four books of the Conics, like that in the Florentine library, which A. Echellensis turned into Latin, not very felicitously.

II. Serenus on the Section of the Cylinder in Greek and Latin. In Greek from the manuscripts of the most Christian king, and in Latin from the version of Commandino, 1566 Bologna, with his own notes and those of Dr Savile and others. III. The two books of Apollonius on the Section of a Ratio, never before seen in the West. In Arabic and Latin from the Selden manuscript, with notes. It is to be enquired whether the book on sections in the Florentine library, of which mention is made in Labbe's *Bibliotheca* (in *biblioth. Labbeana*), is the same work.

IV. The assaults of Thabet, Abu Hamed, Abu Sahl, Abu Mohammed, and other famous geometers on the trisection of a rectilinear angle, in Arabic and Latin with the notes of Borelli and others. The Selden and Graves manuscripts give the text. VI [*sic*]. The lemmata of Thabet in Arabic and Latin, together with the same's treatise on the composition of ratios, also in Arabic and Latin from Selden and Bodleian manuscripts.

Add V. Maurolycus's book of Conics.

Let there be adjoined what is necessary from Schooten, Viviani, Barrow, Torricelli, Cavalieri, Gregory of St Vincent, Mydorge, Werner of Nuremberg, Barozzi, Wallis, Anderson, Vieta, Herigone, Ghetaldi, Ricci, Scaliger.²⁵

The conception was huge, and it is not really surprising, especially given his other scholarly interests, that, neither during his tenure of the Savilian Chair nor after his removal in 1691 to the rich living of Brightwell, did he come anywhere near to bringing it to fruition.

His successor at Oxford was David Gregory, a relatively early member of the famous Scottish academic family. Gregory was no Arabist, but he did

continue the Bernardian tradition by producing in 1703 a much respected edition of the works of Euclid. In 1704, after the death of John Wallis, Edmund Halley was appointed to the Savilian Chair of Geometry. Halley also at that time was no Arabist, but this did not deter him from undertaking an edition of Apollonius' *De sectione rationis*, which was only extant in Arabic. This had been begun by Bernard, and Halley's Latin translation was published in 1706. In his preface he said:

I was approaching a truly difficult and intricate task by undertaking the burden of translating, when utterly ignorant of Arabic, a book written in that language and full of innumerable faults and many lacunæ. But with the help of the papers passed on by Bernard, which like a key opened the door to investigating Apollonius's mind, I first gathered the words that appeared clear to me from Bernard's version, and then, having regard to the argument, and turning over the more obscure bits with myself again and again, they gradually yielded up what they were, and by this method of decipherment (so to speak), I progressed so far that I read through the whole book, and in a way understood it; and then, by going step by step through the same again, I brought the whole work to the form in which you now see it, without the help of anyone else.²⁶

A remarkable indication of how the inner coherence of a mathematical work can overcome both linguistic difficulties and problems of textual corruption. We are told how Halley's efforts excited professional admiration:

I remember the Learned Dr. Sykes, (our Hebrew Professor at Cambridge, and the greatest Orientalist of his time, when I was at that University,) told me, that Mr. Halley talking with him upon the subject, shew'd him two or 3 passages which wanted Emmendation, telling him what the Author said, and what he shou'd have said, and which Dr. Sykes found he might with great ease be made to say, by small corrections, he was by this means able to make in the Text. Thus, I remember, Dr. Sykes expresst himself, Mr. Halley made Emendations to the Text of an Author, he could not so much as read the language of.²⁷

This exercise prepared Halley for a greater task, namely the edition of Apollonius's *Conics*. This was intended to be a joint venture, with David Gregory looking after the Greek side and Halley the Arabic, but Gregory's death in 1708 meant that Halley was responsible for the whole work. His principal Arabic manuscript for this purpose was the famous Golian manuscript already mentioned, which had been acquired by Narcissus Marsh, Archbishop of Armagh, and lent to Halley for the purpose of his edition.²⁸ The result appeared in print in 1710. It has excited scholarly reverence ever since, and, so far as the Arabic side is concerned, has only very recently been superseded.²⁹ However, the very monumentality of the edition emphasises how mathematicians of the era, while according due respect to the Arabs in the development of their discipline, still regarded the principal use of the Arabic language as aiding in the restoration of Greek texts.

NOTES

¹ Proposition V.39, in *Opticæ Thesaurus Alhazeni Arabis Libri Septem.... Item Vitelonis Thuringopoloni Libri X*, ed. F. Risner (Basel, 1572; repr. New York, 1972), p. 150.

² Cf. A. I. Sabra, 'Ibn al-Haytham's Lemmas for Solving "Alhazen's Problem"', *Archive for History of Exact Sciences*, XXVI (1982), 299-324.

³ John Wallis, *Opera Mathematica*, 3 vols. (Oxford, 1695-93-99), II, pp. 669-673; cf. A. I. Sabra, 'Thabit ibn Qurra on Euclid's Parallels Postulate', *Journal of the Warburg and Courtauld Institutes*, 31 (1968), 12-32, pp. 14-15. *The Thirteen Books of Euclid's Elements*, tr. T. L. Heath, 3 vols. (2nd edn, Cambridge, 1926; repr. New York, 1956), I, p. 155.

⁴ John Wallis, *A Treatise of Algebra, both Historical and Practical* (London, 1685), pp. 5-6.

⁵ *The Principal Works of Simon Stevin*, ed. E. Crone et al., 5 vols in 6. (Amsterdam, 1955-65), III, pp. 599-601.

⁶ *Algebra*, p. 4.

⁷ *Algebra*, sig. a2v.

⁸ *Algebra*, p. 4.

⁹ *Algebra*, p. 2; cf. G. A. Saliba, 'The Meaning of al-jabr wa'l-muqābalah', *Centaurus*, XVII (1972-3), 189-204.

¹⁰ *Algebra*, p. 15.

¹¹ Gerardus Johannes Vossius, *De universæ mathesios natura et constitutione liber; Cui subiungitur Chronologia Mathematicorum* (Amsterdam, 1660), p. 61. Cf. Heath, *Thirteen Books*, I, pp. 8-10; F. Sezgin, *Geschichte des Arabischen Schrifttums*, (Leiden, 1967-), V, 118; P. L. Rose, 'Commandino, John Dee, and the *De superficialium divisionibus* of Machometus Bagdedinus', *Isis*, LXIII (1972), 88-93.

¹² M. Feingold, *The Mathematicians' Apprenticeship: Science, Universities and Society in England, 1560-1640* (Cambridge, 1984), p. 139; M. H. Curtis, *Oxford and Cambridge in Transition 1558-1642: An Essay on Changing Relations between English Universities and English Society* (Oxford, 1959), p. 142.

¹³ Thomas Smith, *Admodum Reverendi et Doctissimi Viri, D. Roberti Huntingtoni ... Epistolæ: et Veterum Mathematicorum, Græcorum, Latinorum, & Arabum, Synopsis: Collectore Viro Clarissimo et Doctissimo, D. Edwardo Bernardo.... Præmittuntur D. Huntingtoni et D. Bernardi Vitæ* (London, 1704), p. 11 of the *Vita Bernardi*.

¹⁴ *Vita Bernardi*, pp. 10-11.

¹⁵ Apollonius of Perga, *Treatise on Conic Sections*, ed. T. L. Heath (Cambridge, 1896; repr. Cambridge, 1961), p. lxix; Pappus of Alexandria, *Book 7 of the Collection*, ed. & tr. A. Jones (New York, 1986), pp. 84-85.

¹⁶ J. P. Hogendijk, *Ibn al-Haytham's Completion of the Conics* (Berlin, 1985); for Halley see below at n. 28.

¹⁷ Cf. J. Itard, 'L'Angle de Contingence chez Borelli: Commentaire du Livre V des Coniques d'Apollonius', *Archives Internationales d'Histoire des Sciences*, 14 (1961), 201-24.

¹⁸ *Vita Bernardi*, p. 12.

¹⁹ *The Correspondence of Henry Oldenburg*, ed. A. R. Hall & M. B. Hall, 13 vols. (Vols I-X, Madison, 1965-75; vols XI-XIII, London, 1977-86), VIII, p. 545.

²⁰ Sezgin, *Geschichte des Arabischen Schrifttums*, V, pp. 136-141.

²¹ A Latin version (rather than strict translation) of the first four books of the *Conics* was published by Barrow in his *Archimedis Opera: Apollonii Pergæi Conicorum Libri IIII. Theodosii Sphærica: Methodo Nova Illustrata, & Succincte Demonstrata*. . . (London, 1675).

²² In his edition of Apollonius of Perga, *Quæ Græce Exstant* (Leipzig, 1891-93; repr. Stuttgart, 1974), II, p.LXXIV, J. L. Heiberg identifies this with MS Paris, Bibl.Nat. 2357.

²³ This reference is obscure. Halley in the preface to his edition of the *Conics* (n. 29 below), says, 'Ad Eutocium quidem publicandum non aliud repertum est exemplar Græcum, præter Baroccianum in Bibliotheca Bodlejana adservatum', and Heiberg, *op.cit.*, II, p. IX, commented, 'Is ubi hodie lateat, nescio'.

²⁴ 'Ex translatione Arabica Beni Musa, qui editionem Eutocianam expressit'; even Bernard seems to have assumed that the Banū Musa were a single person.

²⁵ Bernard, *Veterum Mathematicorum ... Synopsis*, in Smith's work cited in n. 13 above, pp. 6-8.

²⁶ . Apollonius, *De Sectione Rationis Libri Duo...* (Oxford, 1706), Preface.

²⁷ *Correspondence and Papers of Edmund Halley*, ed. E. F. MacPike (1932; London, 1937), p. 10. The authorship of the passage is uncertain.

²⁸ *Apollonii Pergæi Conicorum Libri Octo et Sereni Antissensis de Sectione Cylindri et Coni Libri Duo* (Oxford, 1710), Preface; cf. A. F. L. Beeston, 'The Marsh Manuscript of Apollonius' *Conica*, *Bodleian Library Record*, IV (1952-53), 76-77.

²⁹ When the original version of this chapter was written, Apollonius, *Conics: Books V to VII. The Arabic Translation of the Lost Greek Original in the Version of the Banu Musa*, ed. & tr. G. J. Toomer (New York, 1990), had not yet been published. See its pp. xxi-xxv for a discussion of the Latin *fortuna* of Books V-VII up until Halley's edition.

G. A. RUSSELL

THE IMPACT OF *THE PHILOSOPHUS AUTODIDACTUS*:
POCOCKES, JOHN LOCKE, AND THE SOCIETY OF FRIENDS

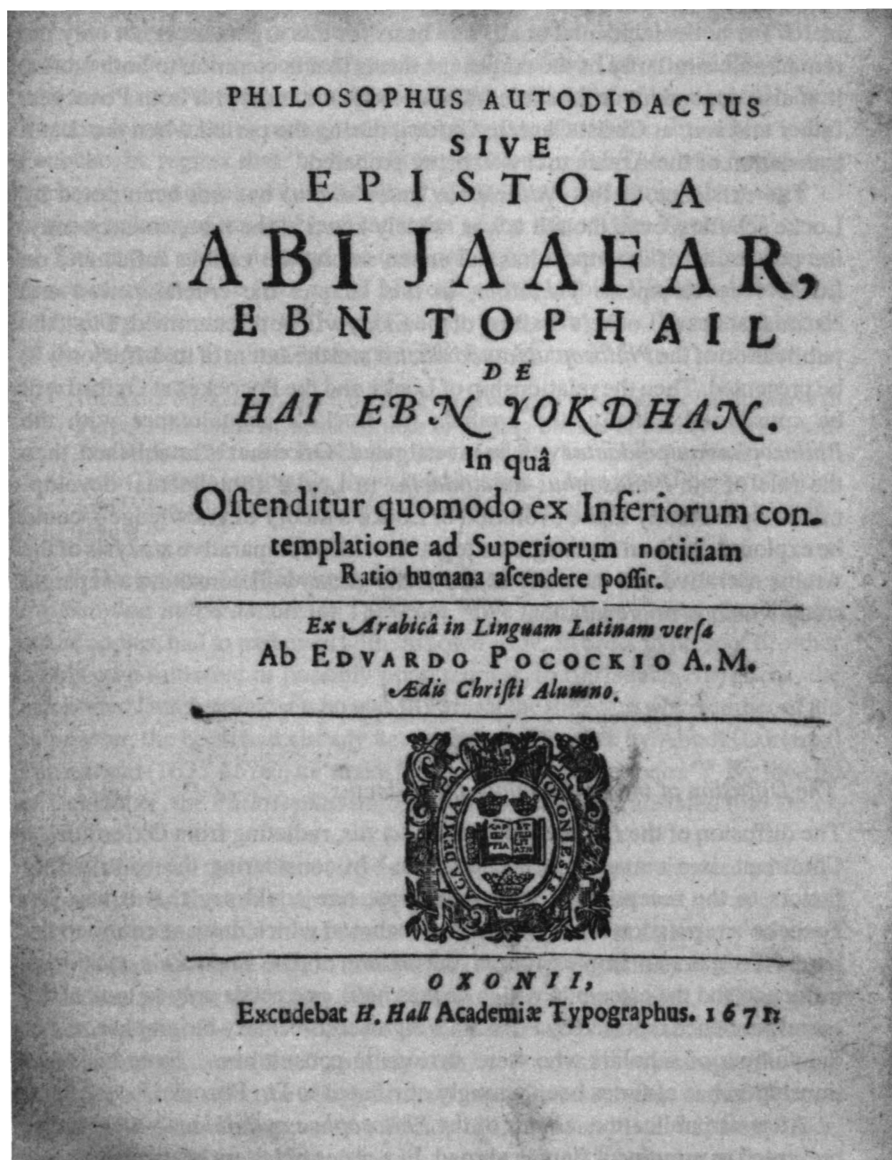
INTRODUCTION

In 1671, the year when Locke started on the first drafts of his *Essay on Human Understanding*, a bilingual text in Arabic and Latin was published at Oxford, entitled the *Philosophus autodidactus* (self-taught philosopher).¹ The work depicted the development of the mind of a child from a *tabula rasa* to that of an adult, in complete isolation from society. By means of sensory experience and reasoning, without any innate ideas, he discovers the natural and physical sciences, God, and morality. One could call this work, with perfect justification, a case study for the main thesis of Locke's *Essay*.²

The Arabic narrative was *Ḥayy ibn Yaqẓān*, written in the twelfth century by Ibn Ṭufayl (d.1185), the physician-philosopher under the Almohads in Muslim Spain.³ The Latin translation was made by Edward Pococke under the supervision of his father, Dr. Pococke, the first Laudian Professor of Arabic (1636) and the Regius Professor of Hebrew (1648), who provided the historical preface to the text.⁴

The immediate question that arises is whether the appearance of this unique narrative and Locke's drafting of the first versions of the *Essay* were purely coincidental or whether there is a connection. The reason for raising such a query is that the publication of the *Philosophus autodidactus* at Oxford comes at a turning point in Locke's intellectual career. Scholars are largely agreed that it was in 1671 that Locke, for the first time in his writing, focused on the question of the nature of mind and its emergence out of experience without innate ideas. This empirical approach formed the nucleus of Locke's theory of knowledge and of what subsequently came to be known as the British Associationist School of Philosophy. Prior to this period, Locke's concerns were social, political, and practical and revealed no specific interest in the kind of epistemological issues which characterise his *Essay*.

The grounds for this dramatic shift in Locke's thought have so far been unclear. It will be argued that Locke's writing of the first drafts of the *Essay*



4. Title page of the *Philosophus autodidactus*. The translator was Edward Pococke, the eldest son of Dr. Pococke, the Laudian Professor of Arabic at Oxford.

on the human intellect, after the appearance of the *Philosophus autodidactus*, in 1671 is not coincidental at all. The basis for this argument is not only the remarkable similarity of the empiricist thesis that is common to both works; it is also dependent on Locke's intimate acquaintance with both Pocockes, father and son, at Christ Church, Oxford, during the period when the Latin translation of the Arabic text was being prepared.

The existence of the *Philosophus autodidactus* has not been noted by Locke scholars, even though it was widely known at the time; consequently, the possibility of its impact has not arisen among the various influences on Locke's development. Therefore, in this chapter the crucial period and circumstances of Locke's drafting of the *Essay* will be re-examined. First, the publication of the *Philosophus autodidactus* and the extent of its diffusion will be presented. Then the relationship of Locke and the Pocockes at Oxford will be considered. Finally, the grounds for Locke's acquaintance with the *Philosophus autodidactus* will be investigated. Once that is established, then the role of the *Philosophus autodidactus* in Locke's intellectual development—specifically in the evolution of Locke's theory of knowledge—could be explored. Such an investigation together with a comparative analysis of the Arabic narrative and the early drafts of the *Essay* will constitute a separate study which is in preparation.

PART I

The Diffusion of the Philosophus autodidactus

The diffusion of the *Philosophus autodidactus*, radiating from Oxford to the Continent, is a remarkable phenomenon.⁵ In considering the contributing factors to the reception of this translation, one could say that it was Dr. Pococke's reputation both at Oxford and abroad which drew attention to the book.⁶ To gain an impression of the extent of Dr. Pococke's sphere of influence and the esteem in which he was held, one needs only to look at the correspondence reported by Pococke's eighteenth-century biographer, and at the number of scholars who were anxious to consult him.⁷ Even his son's translation has at times been wrongly attributed to Dr. Pococke.⁸

After its publication, copies of the *Philosophus autodidactus* were being presented to prominent figures abroad. In a series of letters between September and November, Francis Vernon (1637-77), who was secretary to the British Embassy in Paris at the time, reported that 'by the Doctor's own Direction,' he had delivered copies of 'his Son's Book' to a number of

orientalists at the Sorbonne. He further noted that 'all had read and approved it.'⁹ Not only eminent orientalists or 'Sorbonists' in Paris, who were interested, but also such influential figures as Melchisédec Thévenot (1620-1692), who was in correspondence with most of the celebrities of his time.¹⁰ In fact, Vernon seems to have run out of extra copies. to distribute. In a letter to Dr. Pococke, he regrets that 'he had not begged a copy for Thévenot,' who was apparently 'much taken with the fancy of the Piece' and intended in return 'to make a present of an Arabic manuscript of the life of Abn Tophail'.¹¹

The extent of the demand for the book is corroborated by the correspondence of others. We find, on 27 November 1671, John Wallis approaching Oldenburg, Secretary to the Royal Society, to send copies to Vernon on behalf of Dr. Pococke. It is not, however, only for 'Mons. Thévenot' but also

for some bookseller, since they are so greedy of those books (as appears) in Paris, if hee think fit, some number of them (a dosen or twenty) may be sent him to put off to some Bookseller, here at a price, but move it as from yourself, or me, but not as from Dr. Pocock, who is loth to take y^e confidence of giving him [Vernon] that trouble, unless he should intimate his willingness to undertake it.¹²

By 4 December, Oldenburg is firmly promising to send a copy of the *Philosophus autodidactus* for Thévenot.¹³ We learn that Vernon, having run out of copies, had to part even with 'his own copy' in order to present it, either on his own initiative or possibly upon request, to Christiaan Huyghens, the celebrated Dutch scientist who was in Paris at the time.¹⁴ By November of the same year, the book had already been taken to Florence by Abbot [Lorenzo] Panciàtichi (1635-1676), to 'make the value of it known there.'¹⁵ By the end of December, the *Philosophus autodidactus* was being translated into Dutch in Holland.¹⁶

The efforts of the Oxford circle of Dr. Pococke's supporters were no doubt responsible for the initial distribution of the book. The fact that it was in Latin also made it accessible to the educated elite, and put it 'in a capacity to travel thro' Europe.'¹⁷ These do not, however, explain the popularity of the book, or as Vernon related, why 'they every where made Account of it.' There were urgent requests for the *Philosophus autodidactus* even from scholars who came to Oxford from abroad, to study with Dr. Pococke. For example, Ferrand at the Sorbonne, asked for a copy from one such Swiss scholar, named Ottsius, on behalf of Francis Bosquet, the Bishop of Lodève and later of Montpellier, who 'impatiently expected it.'¹⁸

The bi-lingual publication of the *Philosophus autodidactus* was followed by retranslations into Dutch, English, and German, initially from Pococke's Latin, but subsequently also from the Arabic original.¹⁹ There were reprinted

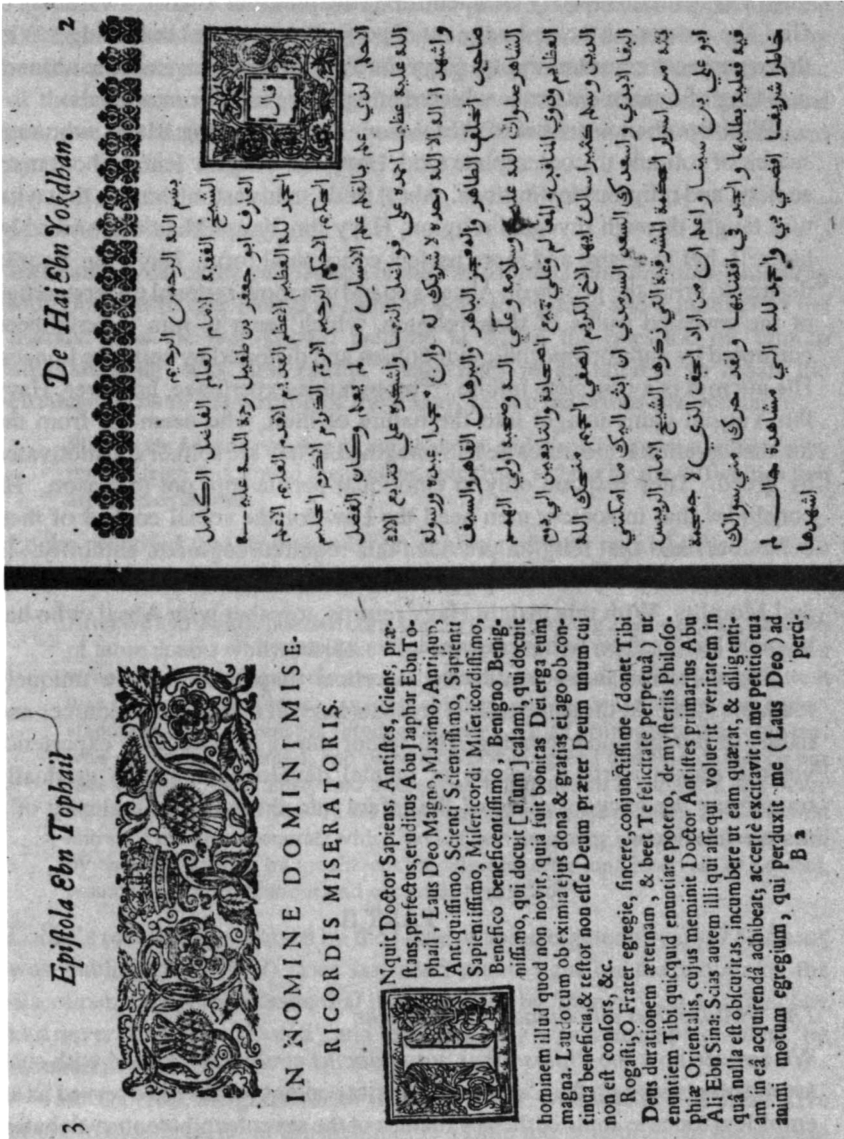
editions, summaries (in English and French), and plagiarised adaptations which continued right into the next century.²⁰ These editions evoked avid responses not only from orientalists, but also from theologians and natural philosophers. The first English translation, from Pococke's Latin edition, was made by a Presbyterian turned Quaker;²¹ a second one by an Anglican vicar.²² A copy was in the hands of the Jesuits.²³ Leibniz, for example, regarded it as an illustration of the excellent philosophical tradition in Arabic.²⁴ Its second Dutch translation was apparently undertaken with the encouragement or possibly on the suggestion of Spinoza.²⁵

Although one should not discount the appeal of its charismatic title, the *Philosophus autodidactus*, to the age of the 'new philosophy', it is not sufficient to explain why an Islamic work from the medieval past should sustain such interest to become literally a best-seller within a short period of time. Its success is particularly surprising in an age which was also characterised, contrary to its label, by unreasonable currents of religious persecution and intolerance. In England 'Papists, Turks, and Muhammadans' were indiscriminately lumped together as 'atheists' threatening both Church and State.²⁶ Therefore in the face of virulent hostility to Islam as a 'false' religion, the enthusiastic reception of an Arabic text which was not scriptural, nor specifically mathematical, astronomical, or medical, defies expectation. Furthermore, its widespread impact is also difficult to reconcile with the waning of interest in Arabic, at the time, in contrast to the enthusiasm of the earlier decades. The answers must clearly be sought in the content of the work and its relevance to the central intellectual concerns of the second half of the seventeenth century.

The Nature of the Narrative: Ḥayy ibn Yaqzān

The *Philosophus autodidactus* is preceded by an introduction by Ibn Ṭufayl where he presents a critical review of the development of philosophy in Islamic Spain, acknowledges his intellectual debt to such figures as al-Fārābī (d.950), al-Ghāzālī (d.1111), and Ibn Sinā (d. 1037), and finally states his purpose in writing the work.

The narrative itself is about Ḥayy ibn Yaqzān (Alive, son of Aware) who, cast up on a desert island as a baby and fostered by a gazelle, survives. As the baby becomes a child, he is forced by his observations to question his identity and to find out why he is different from other animals. The result is a unique, if unlikely, account of how the boy, Ḥayy ibn Yaqzān, grows to adulthood and intellectual maturity by the use of observation, experience, and reason. By his own efforts alone, he progressively discovers the natural and the physical sciences, as well as philosophy. In the process, Ḥayy ibn Yaqzān acquires not



5. The 'Introduction' preceding the narrative in Pococke's Arabic and Latin, bi-lingual edition of the *Philosophus autodidactus* (Oxford, 1671).

only a systematic mastery of scientific principles, but also an awareness of God, the creator, as the embodiment of perfection and total knowledge. With this awareness comes morality. *Ḥayy ibn Yaqzān* thus arrives at the ultimate meaning of human existence which distinguishes man from animals.

With the chance arrival of Absal from a neighbouring island, who is in search of solitude to contemplate God, *Ḥayy ibn Yaqzān* learns about man, society, and religious institutions. Absal finds, to his astonishment, that what was taught through revealed religion, *Ḥayy ibn Yaqzān* had discovered by himself, but in a pure and more perfect conceptual form. *Ḥayy ibn Yaqzān* desires to bring the people on Absal's island to a more rational understanding of the revealed truths of their religion, which seem to him to have been corrupted by anthropomorphic symbolism and distorted by concrete images. His attempt is a complete failure. Through this experience, however, *Ḥayy ibn Yaqzān* gains insight into the nature of men, who seem far from the idealised, rational creatures he had imagined. They are selfish and motivated by greed. They respond only to emotional persuasion, not to reason. He concludes that in society men need the Law for the social control of their behaviour, and that religion provides this required dogmatic authority. In fact, for the majority of men, prophetic religion is their only source of Truth and Morality. With this insight *Ḥayy* returns, together with Absal, who has become his disciple, to his contemplative existence.²⁷

The narrative is no medieval theoretical disputation, but a uniquely readable story. At the same time it presents a novel theory of the sources and nature of human understanding. The author shows in detail how experience via the senses starts a process of mental development which gradually transforms the vacuous mind of the infant into the subtle complexity of a mature intellect.

PART II

The Philosophus autodidactus and Locke

We can see how the *Philosophus autodidactus* could have spread with such astonishing speed on the Continent; how its content would have served as an empirical focus to some of the key themes of the seventeenth-century debates. These debates devolved around the question of whether the concept of God was self-evident (intuitive or innately provided) or derived from rational considerations. They centred on the concept of the 'law of nature' and of 'natural religion', with its implications for morality. They considered the role of religion as an essential aid for social control. The *Philosophus autodidactus* was, in fact, perceived as an embodiment of these issues.²⁸

Above all, the content of the narrative provides a perfect support for the Lockean notion of the mind as a *tabula rasa* where ideas are acquired by means of sensory experience and reasoning as opposed to the Cartesian notion of their innateness. With this background, we can now turn to Locke and examine to what extent Locke was aware of this work and possibly influenced by it.

(A) *The Exeter Meeting*

In the same year as the publication of the *Philosophus autodidactus*, a meeting took place at Exeter House in London between Locke and a number of his friends. It is the well-known meeting at which the question of 'human understanding' was first raised. Years later in an attempt to recall the circumstances of his writing of the *Essay*, Locke describes the occasion.

Five or six friends meeting in my chamber and discoursing on a subject very remote from this, found themselves quickly at a stand by the difficulties that arose on every side.

Locke proposed that they start by an analysis of their own abilities and the limits of their understanding.

After we had awhile puzzled ourselves, without coming any nearer a resolution of those doubts which perplexed us, it came into my thoughts that we took a wrong course; and that before we set ourselves upon enquiries of that nature it was necessary to examine our own abilities, and see what objects our understandings were or were not fitted to deal with. This I proposed to the company, who all readily assented; and thereupon it was agreed that this should be our first enquiry. Some hasty and undigested thoughts, *on a subject I had never before considered*,²⁹ which I set down against our next meeting gave the first entrance into the discourse; which having been begun by chance was continued by entreaty, written by incoherent parcels, and after long intervals of neglect, resumed again as humour and occasion permitted.³⁰

Locke's recollection blurred by the lapse of some eighteen years (*The Essay* was published in 1689) does not shed much light on the nature of the discourse, except to indicate that it was started by 'chance', on a 'subject he had never before considered', and that the *Essay* was written piece-meal 'by incoherent parcels'.³¹

James Tyrell, the grandson of Bishop Ussher, who was one of those 'five or six friends present' at the meeting, is a little more helpful. In the margin of his copy of Locke's published *Essay*, Tyrell notes that 'the discourse on the occasion when Locke first raised the issue of human understanding' was 'about principles of morality and revealed religion.' Thus both recollections

are in agreement that (a) the question of 'human understanding' was raised for the first time at the Exeter meeting; and that (b) the initial discourse was 'very remote from *this*' (Locke); and that it was 'about principles of morality and revealed religion' (Tyrell).³²

If Locke 'had never before' considered the subject, then what triggered the question of 'human understanding' and altered the course of the discussion at the meeting? What could have brought about the particular 'discourse'? (A question which has been raised by numerous Locke scholars without finding a satisfactory answer beyond hypothetical scenarios.³³) If the critical issue is the extent to which 'chance' factors were responsible, as Locke vaguely indicates, then an alternative possibility is that the discourse was directly stimulated by the acquaintance of the participants with the recently published *Philosophus autodidactus*.

(B) *Pococke's Publication of Ḥayy ibn Yaḡzān*

It is significant that in the *Philosophical Transactions of the Royal Society* for 17 July 1671, Edward Pococke's publication was announced together with a summary of its contents, which is worth giving in full.

This Book being translated out of a fair *Arabick* Manuscript in the *Bodleian* Library into *Latin* by the care of the Learned Dr. Pocock,³⁴ and printed in both Languages together, is a very ingenious piece, and by the testimony of the skillful, elegant in the Original, and in excellent style. The design is to shew, How from Contemplation of the things here below, Man by the right use of his Reason may raise himself into the knowledge of higher things; which is here perform'd by a *Feigned History* of an Infant exposed, he knows not how, on an Island not inhabited; where he was nursed up by a *Gazel* (or a kind of Dear), and coming afterwards to years of knowledge, did by his single Use of Reason and Experience (without any human converse) attain the understanding, first of Common things, the necessities of human life; how to shift among the Beasts for his food, etc.; the use of cloaths, of weapons (to keep the beasts in order, who were before too hard for him); then to the knowledge of Natural things, of Moral, of Divine, etc. And afterwards by an accident coming to know that there were other men in the world beside himself, and being removed out of his Island to them, and having learned the Language, was found to excell their studied Philosophers. The whole design handsomely laid and ingeniously prosecuted. The Epistle, written by Abi Jaafar, contemporaneous to Averroes, who lived about 500 years ago . . .³⁵

In this fairly accurate outline of the narrative, presumably by Oldenburg, the Secretary of the Royal Society, the central theme is made clear to anyone interested in the origins and the extent of 'human understanding': '*man . . . by his single Use of Reason and Experience (without any human converse) attain the understanding, first of Common things [to survive], . . . then to the*

knowledge of Natural things, of Moral, of Divine, etc.'

(C) *The Impact of Pococke's Translation and Locke's Essay*

At the Exeter meeting, if the issue turned, as Tyrell stated, on the principles of morality and religion, then what could have been more natural than to discourse on a recently published book, which, by means of 'a Feigned history', provided a concrete argument against 'innate' ideas and an innate notion of God or morality. The content of the *Philosophus autodidactus* could have both initiated the discourse and channeled Locke's thinking to the 'limits' of human understanding. For this to be the case, however, requires, at least, the establishment that Locke was aware of the book and its content.

The Essay Concerning Human Understanding was published in 1689. The title, as we know it, was given and the final draft completed in 1686.³⁶ When Locke had actually started on the very first 'draft' has been the subject of much discussion.³⁷ On the basis of Locke's own statement, it could not have been before the Exeter meeting, the exact date of which has also been in dispute.³⁸ Scholars agree that prior to 1671, Locke was not directly concerned with epistemological issues.³⁹ He had written on the question of the 'Law of Nature'.⁴⁰ He was perhaps gradually moving towards the idea that knowledge of the outside world began in sensory perception, but what he had written pertained largely to his moral and political thought.⁴¹

Locke's intellectual development with regard to the issues of the *Essay* is narrowed down to the period between 1667 and the summer of 1671 when Locke had actually started writing on the human intellect. The evidence is provided by the existence of two manuscript drafts, in Locke's own hand, which are entitled *Intellectus* and *De Intellectu humano*. The first draft is dated '10 Jul. [16]71',⁴² which puts the Exeter meeting earlier.⁴³ Since the *Philosophus autodidactus* was reviewed in the *Philosophical Transactions of the Royal Society* also in July, we can assume that the book itself must have appeared in the previous months. Therefore, the Exeter meeting could very well have been at the time of, or shortly after, Pococke's publication. If that were the case, then the content of the *Philosophus autodidactus* could have been the critical factor responsible for both the discussion at the meeting and Locke's subsequent draft of the *Essay*.

Since considerable evidence points to 1671 as the crucial year for the development of Locke's ideas on 'human understanding', let us review the events. Just before Locke began a draft of the *Essay*, we have a publication which literally describes the development of the mind of an infant from a *tabula rasa* to that of a natural philosopher by means of experience. He 'furnishes the cabinet of his mind' with knowledge about the world, by means

of sense experience and 'reflection' on sense experience. The work provides for Locke, a clear and detailed demonstration of how scientific principles could be empirically acquired. At the same time, it also constitutes a tailor-made case for Locke's conviction [in the *Essay*] that sensory knowledge formed the basis of 'reflection,' leading to the discovery of moral truths.

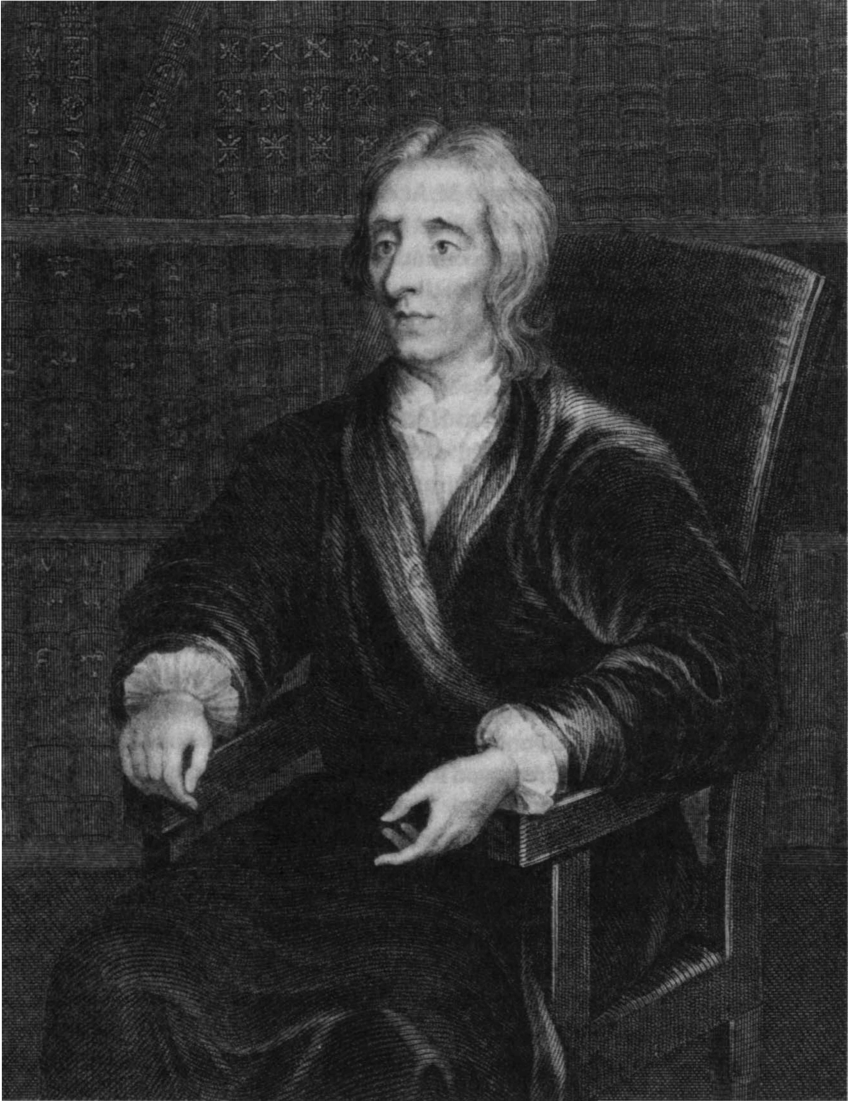
The identity of the issues, which are central to both the *Philosophus autodidactus* and Locke's thought, is dramatic. Although, on its own, it cannot be taken as evidence that Locke had read the work, an examination of the events leading up to the Drafts of the *Essay* reveals a striking sequence. Considered in chronological order, what appears first is the publication of the *Philosophus autodidactus*, followed by the Exeter meeting; then in July we have both 'Draft A' of the *Essay*, which was left unfinished, and Oldenburg's summary of Pococke's book; and finally, early in September, Locke's second draft (Draft B).⁴⁴ To determine to what extent this chain of events is causally linked, we need to re-examine the circumstances when Locke began to consider the question of the human 'intellect' and 'understanding' during the 'crucial' period from 1667 to 1671.

(D) *The Grounds for Locke's Acquaintance with the Book*

1. Oxford

At the time of the writing of the early drafts of the *Essay*, Locke was also part-time in Oxford.⁴⁵ If the popularity of a book emerging from Oxford spread throughout the Continent, it is reasonable to assume that it would have been known in its place of origin. During the period from 1640s to the late 1670s, Oxford apparently had over 110 natural philosophers and virtuosi, who, in spite of the diversity of their backgrounds and activities, represented a highly cohesive social community. The institutional life of the University brought them into daily contact through lectures, meetings, societies and clubs; or outside at taverns and coffee-houses. If they left because of professional commitments, then they corresponded, as we have seen, not only on specific issues, but also on a wide range of general topics.⁴⁶

In such an environment, the circulation of any book would have been immediate, especially when reviewed in the *Philosophical Transactions* of the Royal Society.⁴⁷ We have already learned from the correspondence of Oldenburg that the book, and its popularity abroad ['the greed they had for it'], was known, not only to Vernon, a Fellow of the Royal Society, but also to others who had no Arabic, such as John Wallis, the Savilian Professor of Geometry, who taught Locke as an undergraduate.⁴⁸ Therefore, on these grounds alone, it is difficult to see how Locke, who had been elected as a



6. A portrait of Locke (d. 1704) engraved by H. Robinson from the original painting by Kneller in the Hall of Christ Church. (The books in the background may be Locke's 'Library'.)

Fellow of the Royal Society in 1668, could have remained unaware of Oldenburg's announcement and summary.

During the preparation and publication of the *Philosophus autodidactus*, the Pocockes, both father and son, were at Christ Church, Oxford—the most important and influential College of the University. Dr. Pococke held the chairs of both Arabick and Hebrew. His son, Edward Pococke, the translator, had received both his B.A. and M.A. degrees there. It was also the College where Locke had been both a student (having received his B.A. and M.A.) and a lecturer. In such a close-knit community, it would have been impossible for anyone to be ignorant of a publication 'by the care of Dr. Pococke' if he were associated both with the College and with Dr. Pococke, who was also Canon of Christ Church.

II. Westminster: Introduction to Hebrew and Arabic

Furthermore, at Christ Church, a strong bond existed among the Royalist circle of natural philosophers, virtuosi and divines. This was largely due to their common origin at Westminster, a renowned seventeenth-century school. The source of this bond was its Royalist headmaster, Richard Busby (1606-1695): a man with broad interests in mathematics and natural philosophy. He supervised the production of Latin and Greek grammars for the use of his pupils, for which he is known; but he also introduced the teaching of 'Arabick' into the school (along with his own Hebrew and Arabic grammars) for which he is not generally known. During the Commonwealth, a generation of brilliant pupils emerged under his headship; many of whom were elected to the closed studentships reserved for them at Christ Church. John Locke was one of these students.⁴⁹

What prompted, one might ask, the headmaster of a school such as Westminster to promote Hebrew and Arabic studies? Busby was at Oxford during the period between 1624-1630, when Matthias Pasor (1598-1658) had started giving, in addition to Hebrew, instructions in Arabic through public lectures and private tutorials. A refugee Professor of Mathematics and Philosophy from Heidelberg, Pasor was incorporated M.A. at Oxford in 1624. Two years later, 'oriental languages' were added to his teaching at his own request. Pasor had already acquired Hebrew before leaving Heidelberg, and subsequently studied Arabic both in Leiden under Erpenius, the distinguished Dutch scholar, and in Paris with the Maronite Gabriel Sionita.⁵⁰ It was under Pasor that Pococke had also started his Arabick before moving on to William Bedwell (1563-1632), and then as chaplain to the Levant Company in Aleppo where he acquired proficiency.⁵¹

Pasor's inaugural lecture (*Oratio pro Linguae Arabicae professione*),

which was delivered as an impassioned 'plea for the study of Arabick', and published in 1627 would have been at the root of Busby's interest in Arabic. Pasor marshalled a wide range of arguments for the importance of 'Arabick' in order to persuade the theologian (in elucidating the Biblical texts); the classical scholar (as a key to the 'treasure house of ancient knowledge', both Greek and [with some exaggeration] Roman); and the natural philosopher (as a means of access to Greek texts, particularly in mathematics and astronomy, the originals of which had been lost). By the time Busby became the headmaster of Westminster in 1638/40, the chairs of Arabic had already been established at both Cambridge (1632) and Christ Church, Oxford (1636), with that of Hebrew to follow in 1648. To Busby, it would have seemed an official recognition of their practical and pedagogic utility. How assiduously Busby promoted oriental languages by 1660s is reflected in the letter written by Edmund Castell, the Sir Thomas Adams Professor of Arabic at Cambridge, to Samuel Clarke (1625-1669) at Oxford, enclosing

som papers from Dr. Busby, who presents his kind respects to you, desires the cast of your eye, and your most exact censure, alteration, and emendation of Hebr; Chaldee, Arabic, etc.: Papers which he sends to you, as also that you would, with his service present them to Dr. Pococke. . . Our Request is that he also would be pleased to do the like with you, to read, censure, etc.: with as much severity as may be.⁵²

The extent to which Arabic is taken seriously is clear from the fact that the papers of the students are submitted to the 'severity' of three leading Arabic scholars. Thus under Busby, as an alumni of Christ Church himself, the ties between Westminster School and Christ Church at Oxford (as well as with Trinity College, Cambridge) were clearly strengthened.⁵³ It is not surprising therefore to find Arabic and Hebrew incorporated into the method of electing a King's Scholar for one of these two Colleges.⁵⁴

At Westminster Locke became a King's Scholar under Busby, and went through what was known as the 'challenge' or the minor election. The challenge included not only the classical languages, but also Hebrew and Arabic. This means that Locke's early education included these languages. John Evelyn, who witnessed such 'an Election of scholars at Westminster Schoole to be sent to the Universitie,' confessed in his *Diary* (on 13 May 1661) that such exercises 'in Lat: Gr: & Heb: Arabic & in Theames and extemporary Verses, as wonderfully astonish'd me in such young striplings, with such readiness and witt, some of them not above twelve or thirteen years of age.'⁵⁶

The 'minor' challenge was followed by a 'major' election for places at Oxford and Cambridge which included the delivery of public orations in Latin, Greek, Hebrew or Arabic by the several candidates. It seems to have

been more of a ceremony which came at the end of crucial private negotiations in order to procure the patronage of influential and prominent persons. We know from Locke's personal letters (4 and 11 May 1652) that he went through the major election and prepared his orations in both Latin and Hebrew.⁵⁷

What Locke thought of this educational process, is reflected in his preference, in later years, of private tutoring as opposed to public school. He was highly critical of the methods adopted for the teaching, particularly of classical and oriental languages, no doubt with his Westminster experience in mind.⁵⁸ 'Is it worthwhile,' he asks, 'to hazard one's son's innocence and virtue for a little Latin and Greek?' A knowledge of Latin was essential, but, contrary to the practice of his age, Locke thought, Greek, together with Hebrew and Arabic should be left to the 'profess'd scholar.'⁵⁹ Evelyn also remarked in his *Diary* that 'pitty' it was that what the pupils 'attaine here [at Westminster] so ripely, they either do not retaine or improve more considerably when they come to be men.' In concluding, however, that 'though many of them do,' he was more optimistic than Locke.⁶⁰

There is no question that Westminster formed the beginning of the introduction to Arabic and Hebrew for many scholars who went into different professions ranging from theology to medicine and politics.⁶¹ Indeed, among Locke's generation of Busby's pupils some acquired enough competence later to become 'profess'd scholars' in Arabic, such as Henry Stubbe (d. 1676) with whom Locke corresponded on the question of tolerance,⁶² and Humphrey Prideaux (1648-1724), who became a lecturer in Hebrew at Christ Church.⁶³

Those who did not become 'profess'd scholars' still took an interest in Arabic and Hebrew. Francis Vernon (1637?-1677), the virtuosi who circulated the copies of the *Philosophus autodidactus*, is a good example. He matriculated at Christ Church, Oxford in 1654, two years after Locke, and received his B.A. in 1657-8 and M.A. in 1660.⁶⁴ With his 'knowledge in many sciences and languages,' Vernon 'impressed' the mathematicians such as Edward Bernard (1632-96), James Gregory (1638-75), and John Collins (1625-83). He procured texts for them from abroad and acted as a purveyor of scientific information. Like Locke, he later became a Fellow of the Royal Society in 1672, proposed by Oldenburg.⁶⁵ It should be noted that Vernon was at Christ Church during the years when Locke was a student, tutor and lecturer.

III. Christ Church at Oxford and Pocockes

With his matriculation at Christ Church, Locke's exposure to Arabic and

Hebrew continued. After four years as an undergraduate, Locke also completed his M.A. (1656) for which Hebrew and Arabic were required in accordance with Laud's statutes.⁶⁶ Along with history, astronomy, mathematics, and philosophy (i.e. Aristotelian logic and metaphysics), Locke's studies included these two languages.⁶⁷ At that time, Pococke was the most distinguished orientalist in England, holding the Arabic and Hebrew chairs. He was also Canon of Christ Church. In addition to Hebrew and Arabic classes twice a week,⁶⁸ Locke would have also been attending Dr. Pococke's Thursday sermons at Christ Church.⁶⁹

Pococke is regarded by all of Locke's biographers, as the teacher who influenced him most in his early years at Oxford, and to whose lectures 'Locke paid more attention than was prescribed by the University rules.'⁷⁰ Locke's turn to Royalist views, in spite of his Puritan background, is, for example, largely attributed to Pococke.⁷¹ Considering Locke's attitude to the teaching and relevance of 'oriental languages', it is significant that of all his teachers, the one 'he most revered' should have been 'Dr. Edward Pococke'.

Locke's own statements leave no doubt of his great admiration of Pococke: 'I do not remember I ever saw in him any one action I did or could in my own mind blame or think amiss in him'; and 'He had the silence of a pupil where he had the knowledge of a master.' What impressed Locke was not only Pococke's 'great learning':

So extraordinary an example, in so degenerate an age, deserves, for the rarity, and, I was going to say, for the incredibility of it, the attestation of all that knew him, and considered his worth. . . . his other virtues and excellent qualities had so strong and close a covering of unaffected humility, that though they shone the brighter to those who had the opportunity to be more intimately acquainted with him, and eyes to discern and distinguish solidity from show, and esteem virtue that sought not reputation—yet they were the less taken notice and talked of by the generality of those to whom he was not wholly known.⁷²

Clearly, Locke was among those who had the 'opportunity to be more intimately acquainted' with Pococke. Bourne suggests that Pococke 'seems to have been in simplicity and nobility of temperament very much like his panegyrist,' and that 'perhaps Locke learnt something more and better than Hebrew and Arabic from him.'⁷³

In fact, when material was being collected in 1704 for a biography of Dr. Pococke, Locke was approached by Humfry Smith, Vicar of Dartmouth, because of having been informed that Locke was 'for several years intimately acquainted with Dr. Pocock.'⁷⁴ This choice is all the more significant when one considers Pococke's wide range of acquaintances and friends. Within England alone, these included not only scholars concerned with 'oriental'

languages, but also natural philosophers who consulted Pococke, and who, like John Wallis (1649-1703), owed their interest Arabic mathematics to him. During the Civil War, the sequestrators of Laud's estates tried illegally to take away the endowment for the Arabic lecture. It was the pressure from Pococke's friends and admirers—such as Gerard Langbaine, provost for Queen's, John Greaves, the Savilian Professor of Astronomy and John Selden, Burgess of the University—which compelled them to restore it. Furthermore, it was the petition from Oxford scholars, masters, and others, only two of whom were Royalists, which enabled Pococke to continue his two lecture-ships. When he came under threat of ejection from his ministry, it was again the leading Oxford scholars, including Seth Ward, John Wilkins, John Wallis, headed by John Owen (1616-1683) who warned the commission of the contempt they would draw upon themselves if they turned out Dr. Pococke for such an absurd charge as 'insufficiency', when his vast learning and accomplishments were the admiration of Europe.⁷⁵

His following was not confined to Oxford, but extended to Cambridge and London as can be deduced from the subscriptions for Dr. Pococke's publication ventures. Edward Bernard (1638-96),⁷⁶ for example, urges Dr. Pococke in 1671, (coming perhaps in the wake of the reception of the *Philosophus autodidactus*), to publish his translation of Arabic Proverbs (*Chiliads*) over which he had spent thirty to forty years:⁷⁷

The Encouragement was not inconsiderable. Dr. Castell had promised to secure a hundred Books for Cambridge and a still greater Proportion might be depended upon in Oxford, besides what the Assiduity of his good Friends in London such as Mr. Boyle, etc. might get off.⁷⁸

Boyle, for example remained in close contact, commissioning Dr. Pococke for translations, requesting explications of inscriptions, and showing concern over Dr. Pococke's sickness which left him lame. Locke stands out against such a background. As Pococke's eighteenth-century biographer, Twells, points out, 'of all the Encomiums bestowed on our author after his Death, none was so full as that which was drawn up by the celebrated Mr. Locke.'⁷⁹ His contribution, an eleven-page long obituary letter, preserved in the Lovelace collection, leaves no doubt that a close relationship existed between Dr. Pococke and Locke.⁸⁰ This is further corroborated by Humfry Smith's acknowledgment that of the 'many letters' from those 'who were intimately acquainted' with Dr. Pococke, he gained 'a clearer and more distinct Idea of his great Worth' from Locke's 'than from any other hand.' In fact, encouraged by Locke's letter, Smith further requests Locke to answer a list of specific questions about Pococke's life to which he had found no information.⁸¹ Locke is not, however, able to comply in any greater detail because of



7. The portrait of Dr. Pococke (d. 1699) reproduced from L. Twells, *The Theological Works of the Learned Dr. Pocock, Sometime Professor of the Hebrew and Arabick Tongues, in the University of Oxford, and Canon of Christ Church . . . to which is prefixed An Account of his Life and Writings never before printed* (London: 1740).

his 'decaying bad memory which did ill serve my desire to obey your commands'. Writing, now at the age of seventy-two, he regrets not having been

put upon this task soon after his [Dr. Pococke's] death, I might have better furnished than this, and with particularities fitter for your purpose to fill up the character of so good and extraordinary a Man, and so exemplary a life.

In a second letter, Locke again apologises that

... so copious a Subject has lost, in my bad Memory, so much of what heretofore I could have said, concerning that Great and Good Man, ... Time, I daily find, blots out apace the little Stock of my Mind, and has disabled me from furnishing all that I would willingly contribute to the Memory of that Learned man.⁸²

Although Locke's biographers refer to Dr. Pococke as one of the most influential figures on Locke, and the one 'most revered' by him, they have not investigated this relationship. If Dr. Pococke's works are mentioned at all, no reference is made to his collaboration with his son on the *Philosophus autodidactus*—a work, even from its title, most likely to be of interest to Locke.

IV. Edward Pococke and Locke

The beginning of the friendship between Locke and Dr. Pococke is dated to the period after 1660 when Pococke returned to Christ Church. With the Restoration, Pococke ended his exile and regained his position as Canon. It coincided with Locke's appointment as tutor also at Christ Church.⁸³ In addition, Locke was assigned to the college Readerships in Greek and Rhetoric and to the Censorship of Moral Philosophy and held these offices (1661-64) which were usually assigned to clergymen.⁸⁴

Thus when Edward Pococke matriculated at his father's College at the age of thirteen, Locke was also present both as lecturer and tutor. A record of his pupils' names and the fees they paid him exists in an account book in which Locke had kept note of his income and expenditure.⁸⁵ In the first two years of Locke's duties as tutor, which he took up in 1660/61, listed among his pupils is Dr. Pococke's eldest son.⁸⁶ We do not know the exact nature and extent of Locke's relationship with Edward Pococke, who seems to have been one of Locke's younger pupils.⁸⁷ It can, however, be ascertained from the fact that the tutor-pupil relationship at the time was more than merely pedagogic.⁸⁸ In addition to performing his academic duties to his charges, the tutor had to take a keen interest in almost every aspect of their welfare. As Cranston put it, 'a tutor stood in *loco parentis*'; which meant that he would advise them in the

conduct of their private lives and be responsible for their money (even though, unlike the tutors prior to 1660, he did not have to 'ensure the salvation of their soul').⁸⁹ Letters from some of the parents of Locke's pupils also show how much was expected of him.⁹⁰ A number of Locke's pupils remained in touch with him after they left Oxford. Therefore, the interaction between Locke and Edward would have been very close.

Thus in 1660, Locke became not only a lifelong friend of Dr. Pococke, but also [and most likely because of it] 'tutor' to Dr. Pococke's eldest son, the future translator of the *Philosophus autodidactus*. Between 1661 and 1664 while Edward was taking his B.A., which he completed on Feb. 1664-65,⁹¹ Locke was still at Christ Church, lecturing in Greek and Rhetoric. Even when Locke's stay at Oxford became intermittent, with the beginning of his relationship in 1665 with Lord Ashley (the later Earl of Shaftesbury), Locke kept his chambers and his books at Christ Church.⁹²

After this period, he still remained in close contact with both Pocockes. For example, in 1672, a year after the publication of the *Philosophus autodidactus*, he commissioned Edward, who was no longer at Oxford, to translate a text by Maimonides. Twells reports that

For about this Time, Mr. Locke, since then so well known to the World, in a letter to the Father, mentions his having engaged his Son at Salisbury, in translating and printing a Part on Maimonides, and that he had spoken with Mr. Boyle about it: He desired to have it printed, just as that Piece translated by Mr. Prideaux was.⁹³ He further assured Dr. Pococke that it would greatly encourage those who wished well to the Work, if he could assure them, that it should be done under the Father's Direction.⁹⁴

Although Twells is rather vague about the date of this letter,⁹⁵ a number of interesting points emerge from it. First of all, it shows that Locke was still corresponding with his former pupil as well as with Dr. Pococke. Secondly, he is engaging Edward to undertake a translation which indicates that Locke was familiar with Edward's expertise in Hebrew and Arabic. And Edward Pococke had only one major publication to his name: the *Philosophus autodidactus*. Thirdly, Locke's request that the translation 'should be done under the Father's direction' does not reflect any mistrust of Edward's abilities. On the contrary, it reveals Locke's knowledge of the success of the *Philosophus autodidactus*, which was done 'under the Father's direction'.⁹⁶ Therefore, the association of the 'Father' with the project could similarly ensure the success of the new project and procure more subscriptions.⁹⁷ Otherwise why engage Edward, and not Dr. Pococke?

Leaving aside Edward's relationship to Locke, for the moment, what also emerges is the impression that, in spite of the wide diffusion of the *Philosophus*

autodidactus, Edward had not been able to establish himself as an orientalist in his own right, and that he remained in the shadow of his father, as the 'Son to the famous Dr. Pococke'. He seems not only to have failed to succeed to his Father's chairs of Arabick and Hebrew, but to have abandoned 'oriental studies' entirely and died in obscurity.⁹⁸ The reasons are not clear. According to Hearne, there was no doubt that 'he understands Arabick and other oriental Tongues very well, but wanted Friends to get him y^e Professorships of Hebrew and Arabick at Oxford'.⁹⁹ It is a curious observation, considering his father's influence and position.¹⁰⁰

Although we have no statement of what Locke thought of Edward, Locke's 'obituary letter' leaves no doubt of his close relationship with Dr. Pococke.¹⁰¹ It reflects an intimate knowledge of Dr. Pococke's scholarly activities, his translation projects and publications, his unfulfilled plans, as well as details of his personal life and characteristics of his personality, even his sense of humour. Above all, it reveals Locke's deep affection, and boundless admiration, to the point of reverence, for Pococke, whom he describes as a man of deepest humility, gentle and unassuming manners, greatest temperance, completely devoid of vanity or ostentation, of 'a liberal mind, given to hospitality'; if he indulged in any one [thing] too much, 'it was that of study'. And further that he was

the readiest to communicate to anyone who consulted him. Indeed he was not forward to talk, nor ever would be the leading man in the discourse, though it were on a subject that he understood better than any of the company, and would often content himself to sit still, and hear others debate in matters in which he was more a master of. He would not put to shame in their presence or censure in their absence anyone for their ignorance nor display the arts of triumph and ostentation, frequently practised by men of skill and ability. I can truly say that *I knew not anyone in that University whom I would more willingly consult, in any affair that required consideration, nor whose opinion I thought better unto the hearing than his, if he could be drawn to enter into it and give his Advice.*¹⁰²

Such detailed knowledge indicates that Locke spent a great deal of time in conversation with Dr. Pococke. With such a relationship it would seem unthinkable for Locke not to have known of the publication of his admired friend and mentor, or of the translation of his pupil. Locke's own words, again in the obituary letter, reinforce this: 'The Christian world is a witness to his great learning, that the Works he publish'd would not suffer to be conceal'd. . .'.¹⁰³ It is also most likely that Locke's name was suggested to Humfry Smith by Edward, who was assisting Smith in the preparation of the 'Account of Dr. Pococke's Life'.¹⁰⁴

Although we do not know exactly when father and son started on the

translation of *Ḥayy ibn Yaqẓān*, it could not have been before Edward received his Master of Arts in 1667/68. Since Arabic was one of the required languages for an M.A., Edward would have become proficient only after the completion of his degree.

In the introduction to the *Philosophus autodidactus*, Dr. Pococke states that it was undertaken by Edward with his persuasion and encouragement. An earlier unfinished translation into English was already attempted by Dr. Pococke, possibly during his exile in Childrey, near Berkshire, during the Civil Wars. The extant fragments of this translation, consisting of four folios bear the date of Jul: 10. 1645.¹⁰⁵ Could Dr. Pocock have resurrected this particular Arabic manuscript because of his acquaintance with Locke? Considering the range of his scholarly activities, Dr. Pococke could have had his son assist him in a number of works on which he was then engaged. Furthermore, the Latin title is not a direct translation of the Arabic original, *Ḥayy ibn Yaqẓān* (Alive, son of Aware). Since Dr. Pococke's English translation does not bear it either, one is tempted to think that the title, *Philosophus autodidactus* (the self-taught philosopher), might have even been inspired by Locke. It would have been unusual for Dr. Pococke, a theologian, and Locke, philosopher—who 'learnt much in conversation'—not to have discussed the implications of such a work for 'Morality' and 'Revealed Religion'.

Prior to this same period, Locke had treated many subjects while preparing for his small encyclopaedias. 'But never in these early papers [up to 1667], it is interesting to note,' as Aaron points out, 'is he concerned with metaphysical matters; nor do these problems of epistemology to which he was later driven here disturb him.'¹⁰⁶ Even if some of the earlier 'Essays' are shown to have an epistemological concern, what is important is that such a concern does not seem to have been central to Locke's thought before the time of the translation of the *Philosophus autodidactus*. In fact, the resurrection of *Ḥayy ibn Yaqẓān* and its Latin translation by Edward, 'with the help of his father', coincide with the shift in Locke's interest to questions on the nature and extent of 'human understanding'.

Locke not only 'learnt much in conversation', as the Exeter meeting indicates, he was also a voracious reader. For example, Aaron states that 'it is probable that no book of any worth published in England during his adult years passed unnoticed by him.'¹⁰⁷ This is confirmed by Locke's unusually large private collection of more than three thousand books. A list of this 'Library' exists in Locke's own hand.¹⁰⁸

At the time when Dr. Pococke was distributing copies of his son's translation, Locke was at Oxford, starting on the second 'Draft' of the *Essay*.

Given his avid interest in books, Locke would have been presented with a copy, if not by his former pupil, certainly by his admired friend. Such an omission would have been entirely out of character with Dr. Pococke. By the time Locke left for Somerset in September 1671, the copies of the *Philosophus autodidactus* had also left Oxford and were already circulating in France.

On the basis of all the evidence, the conclusion is inescapable that not only Locke must have known the work, but also that he must have been intimately acquainted with the progress of the whole project. Thus the period (1667-1671), during which Locke first began to consider the 'problems' of the *Essay*, and put them in writing for the first time, coincides precisely with that of the translation, publication and dissemination of the *Philosophus autodidactus* by Edward and Dr. Pococke.

(E) *Evidence from Locke's Papers*

I. Locke's Library Catalogue

Curiously, however, Locke's 'Library Catalogue' contains no copy of the *Philosophus autodidactus*. This, in itself, is not significant. First of all, in his frequent moves, and particularly when he had to flee to Holland because of Shaftesbury's political position, Locke's books were removed from Oxford to London and from London to a friend's house in the country, near Oxford. There is nothing to show what titles were in Locke's chambers in the summer of 1671 when he was making the first Drafts of the *Essay*.¹⁰⁹ Some of his books (coming under the officially condemned titles) were burned at Oxford in 1683, partly, it seems, under Locke's supervision to dispose of 'embarrassing' possessions. Out of these, a few were saved by James Tyrell,¹¹⁰ some were given as gifts.¹¹¹

Far from being representative of his full collection, the record of Locke's library reflects only what was available to him in the last phase of his life. Harrison and Laslett emphasise that of the 3,641 titles which Locke owned between 1670 and the early 1700's, a large number (685) were not registered in his final catalogue even though some of those were in his ownership at the time.¹¹²

Locke's 'Library Catalogue' does, however, reveal a number of important items: for example, Locke subscribed to and owned twenty-two volumes of the *Philosophical Transactions* of the Royal Society for 1665-1702, including the one [volume VI 1671] which contains the summary of *Philosophus autodidactus*.¹¹³

Secondly, it lists Baltasar Gracian's *L'Homme de Cour* (Ha: 1685),¹¹⁴ the

French translation of the first volume of a three-part Spanish narrative—the part which was based on *Ḥayy ibn Yaqzān*. In fact, the similarity between *El Criticón* and the *Philosophus autodidactus*, was first noted by Paul Rycaut (1629–1700), diplomat and a Fellow of the Royal Society, in the preface to *The Critick* (London, 1681), his English translation of the Spanish work.¹¹⁵

Furthermore, there are sufficient titles in the ‘library’ to reflect Locke’s interest in Arabic and Hebrew, including a French translation of the *Qur’ān*.¹¹⁶ Dr. Pococke’s translations from Arabic,¹¹⁷ and commentaries on the minor prophets (Hosea, Micah, and Joel) are also listed.¹¹⁸ One would assume that Locke would have been more keen to own a copy of the *Philosophus autodidactus* than the message of a ‘false prophet’.¹¹⁹ Some of these may, however, be remnants of textbooks from his Oxford studentship. The omission of the *Philosophus autodidactus*, when Dr. Pococke’s works are included, could only be due to the incompleteness of the record.

II. The Quaker Connection: Keith, Barclay, and Furly

Locke’s ‘Library Catalogue’ lists, however, a number of works by two leading figures of the Quaker movement, George Keith and Robert Barclay.¹²⁰ Their inclusion may raise questions in the light of Locke’s attitude towards Quakers—particularly, his reaction to the dangers of ‘enthusiasm’, or reliance on emotional conviction as a basis of truth—but it provides an additional channel for Locke’s acquaintance with the Arabic narrative.¹²¹

George Keith was responsible for the first English translation in 1674 from Pocockes’ *Philosophus autodidactus*—a translation which also bears a significant relationship to the ‘Society of Friends’ or the Quaker movement.¹²² Keith (1639–1716), a Scotsman who was educated at Mariscal College, Aberdeen, comes also from a theological background which combined mathematics and ‘oriental’ languages.¹²³ Instead of being ordained a Presbyterian chaplain, he was converted to Quakerism around 1662.¹²⁴

Why would a Presbyterian-turned-Quaker translate the Arabic narrative? From the introduction to the translation, it is clear that Keith had examined not only the Latin text but also knew of the Dutch translation. The reasons for his interest are explained in his ‘Advertisement to the Reader’:¹²⁵

after it came into my hands and that I perused it, I found a great freedom in mind to put it into English for a more general service, as believing it might be profitable unto many; but my particular *motives* which engaged me hereunto was, that I found some good things in it, which were both very savoury and refreshing unto me; and indeed there are some sentences in it that I highly approve, as where he saith, *Preach not thou the sweet savour of a thing thou hath not tasted*; . . . Also he sheweth excellently how far the *knowledge* of a man whose eyes are spiritually opened, differeth from that *knowledge* that men

acquire simply by hear-say, or reading: and what he speaks of a degree of knowledge attainable, that is not by *premisses premised and conclusions deduced*, is a certain truth, the *which is enjoyed in the conjunction of the mind of man with the supreme Intellect, after the mind is purified from its corruptions and is separated from all bodily images, and is gathered into a profound stillness*. These with many other profitable things agreeable to Christian principles are to be found here.

As we can see from this explanation, Keith found a remarkable affinity between this 'Mohammedan' text and his own form of Nonconformist Christianity where personal experience is put above the established dogma of the Church. At the same time, he is acutely aware that such an affinity might seem inherently incongruous to his readers. Rather defensively, he adds that 'the reader' must not think it 'strange' that the 'Author and the person of whom he writeth hath been a good man, and far beyond many who have the name of Christians.' The book will serve to rectify the 'neglecting' of the 'inward testimonies in the soul and mind of man it self.'¹²⁶

Keith's translation seems to have coincided with his drafting of the formal Quaker manifesto, or 'confession of faith,' in co-operation with Robert Barclay (1648-1690), the highly influential Scottish apologist for the Society of Friends.¹²⁷ For Keith, the *Philosophus autodidactus* represented precisely what he summarised as the Quaker 'common notion': 'the sufficiency of inner light.' The Quaker tenets were put forth in 1675 as fifteen propositions, referred to as *Theses Theologiae*, a public discussion of which was held at Aberdeen. Robert Barclay's *Apologia*, prepared in defense of these 'theological theses', was printed in Amsterdam in 1676.¹²⁸

Keith seems, not only to have influenced Barclay in the shaping of the Quaker phraseology, but also to have provided him with a 'quaker' *par excellence*, namely *Ḥayy ibn Yaqzān*. The self-taught philosopher appears in the *Apology*—Propositions V and VI (par. xxvii)—as the perfect illustration of the 'experience of inner light without the means of the Holy Scriptures'.¹²⁹

In his summary, Barclay leaves out the intellectual development of *Ḥayy ibn Yaqzān*, and focuses, like Keith, only on the final attainment of the knowledge of God through personal experience. Although Barclay may have seen Pococke's Latin publication, the central statement of his summary, though less verbose, is taken almost verbatim from the 'Advertisement to the Reader' in Keith's version of the *Philosophus autodidactus*.

Yea there is a book translated out of the Arabick, which gives an account of one Hai Ebn Yokdan, who without converse of man, living in an island alone, attained to such a profound knowledge of God, as to have immediate converse with him, and to affirm that the best and most certain knowledge of God is not that which is attained by *premisses premised and conclusions deduced*, but that,

*which is enjoyed by conjunction of the mind of man with the Supreme Intellect, after the mind is purified from its corruptions and is separated from all bodily images and is gathered into a profound stillness.*¹³⁰

Keith, fully aware of his contribution to the *Apology*, gives an account of it years later in his *Standard of the Quakers examined, or an answer to the Apology of Robert Barclay*.¹³¹ By that time he had given up Quakerism, after a life spent in and out of prisons with acrimonious battles raging from England to America (Pennsylvania), where he presumably carried at least the summary of Hayy ibn Yaqzān, if not a copy of his own translation.¹³²

The Apology, as the most authoritative and systematic statement of Quaker principles, was highly influential in its original Latin as well as in its English, Dutch, French, German, and other versions. In the *Apology*, the Quaker movement was defined as a religion of 'inner light', against both Roman Catholicism and Anglicanism, where neither the Church nor the Scriptures could claim ultimate authority; the Holy Spirit alone, working through the believer, led to Salvation.¹³³ Hayy ibn Yaqzān was seen as the perfect demonstration of religion as an individual experience of 'inner light' and served Quaker purposes. In fact, the eighteenth-century English translation from the Arabic original by Simon Ockley (1678-1720) was largely in reaction against the Quaker interpretation and use of the *Philosophus autodidactus* as a mouthpiece for 'enthusiastick notions'.¹³⁴ The passage was withdrawn from the *Apology* in 1779 by the Society of Friends.¹³⁵

The Quaker use of the *Philosophus autodidactus* would have been of intellectual interest to Locke in his concern with 'nonconformity' versus authority, and the implications of 'enthusiasm' versus 'reason'.¹³⁶ The translation of the *Philosophus autodidactus* is not given with Keith's other works (dating from 1675) in Locke's 'Library Catalogue'. The edition of Barclay's *Apology*, which contains the summary of Hayy ibn Yaqzān is included among the listed titles.¹³⁷ The connection between Locke and the Quakers, however, goes beyond Locke's collection of Quaker books.

While Locke was finishing his *Essay* between 1687-89, he had moved from Amsterdam to stay in the household of Benjamin Furly (1636-1714), an English Quaker who had settled as a merchant in Rotterdam sometime after 1659. Furly was also a bibliophile, with an impressive command of languages.¹³⁸ Before coming to Holland, he had given painstaking assistance to Henry Stubbe, the arabist, in his compilation of the 'Battle Door' which was for teachers to learn singular and plural cases in thirty-five languages. That 'a mere merchant of humble birth should be so learned in Latin, Hebrew and other languages' apparently impressed his visitors.¹³⁹

Benjamin Furly was closely associated with the leaders of the Quaker

movement, not only William Penn, whom Locke met,¹⁴⁰ but also Keith and Barclay for whom Furly acted as interpreter in their missionary forays into Europe shortly after the publication of the *Apology* in 1676.¹⁴¹

When Furly's library was auctioned at his death, *The Catalogue* contained 4,400 titles.¹⁴² Furly's books reflect his passion for religious liberty as well as his interest in unusual topics. Having settled in Rotterdam, sometime after 1659 and before 1677, Furly is unlikely not to have had the Dutch translation of the *Philosophus autodidactus*, published in 1672—a work to which 'inner light' was seen to be central. It is most probable that Keith was introduced to this edition by Furly, as there is no evidence that he knew Dutch.¹⁴³

(F) *Bibliothèque Universelle et Historique*

According to his biographers, Locke was considerably influenced by his stay in Holland, both by what he read in Furly's remarkable library and by the people he met. Furly's house had become a meeting place for Quakers as well as for such radical theologians as von Limborch (1633-1712)¹⁴⁴ and Jean Le Clerc (1657-1736), who at the time was the Professor of Hebrew and Philosophy at the Remonstrants' College in Amsterdam, having accepted the chair in 1684. When Locke became acquainted with him in Amsterdam during the winter of 1685-86, Le Clerc was preparing the first issues of his new literary journal, *Bibliothèque Universelle et Historique* (1686-93, 25 vols.), with which Locke became closely involved.¹⁴⁵

In 1686, Le Clerc published a *twenty-two* page summary of the *Philosophus autodidactus*.¹⁴⁶ In the preceding volume, an article by Locke appeared, entitled 'Methode nouvelle de dresser des Recueils, communiquee par l'Auteur.'¹⁴⁷ It was the French version of his 'Method of a Common-Place Book', which gave an account of how Locke set out materials in his commonplace books—a cross-reference and index system for his notes.¹⁴⁸

The question that arises first of all, is why a long summary of the *Philosophus autodidactus* was made fifteen years after the first publication of Pococke's Latin in 1671. The Dutch translation from the Latin had appeared in 1672. And secondly, 'who summarised [and reviewed] the *Philosophus autodidactus*?' Could it have been Locke? The answer to the first question is simple. In 1686, a second English translation of the *Philosophus autodidactus* was published in London by George Ashwell, the Rector of Hanwell, Oxfordshire.¹⁴⁹ We know that Locke, as a voracious reader and collector, kept abreast of 'book of any worth published in England.' Aaron states that even when Locke was in France and in Holland, he 'kept himself well informed of English publications and he also knew of the more important books published in those countries.'¹⁵⁰

It is significant that in 1685/86, the same year when Locke was completing a final draft of his *Essay*, we have an extraordinarily long summary of the *Philosophus autodidactus* in the journal with which Locke was closely involved. According to Fox Bourne, 'there can be no doubt that, if Locke did not take part from the first in the deliberations as to the nature and purpose of the new review, he soon became one of Le Clerc's chief advisers on the subject. He also became one of his coadjutors.'¹⁵¹ In fact, Locke seems to have been the author of the reviews of English books on 'theological and scientific subjects', scattered even in the early volumes of the *Bibliothèque Universelle*. He is considered to have been the author, especially, of articles which appeared in December 1686 on, for example, Boyle's *De Ipsa Natura* and later in September 1687 on Sydenham's *Schedula Monitoria*.¹⁵² We know that Locke did not only review new books. Between July 1687 and February 1688, he also contributed nearly everything in the journal, including an epitome of his *Essay*, which was by then completed, but still unpublished. The epitome was translated into French by Le Clerc and entitled 'Essai Philosophique concernant L'Entendement'.¹⁵³

If Locke reviewed works by Boyle and Sydenham, whom he knew well, then what better candidate than him to summarise the English translation of the *Philosophus autodidactus*, the joint work of his esteemed friend and of his pupil from his former College—or at least to advise Le Clerc if Le Clerc were the author of the French summary. In either case, the introductory description of the work, leaves no doubt of Locke's knowledge of it:

THE HISTORY OF HAI EBN YOKDHAN, Or the Self-taught Philosopher. L'Histoire de Hai Ebn Yokdhan, ou le Philosophe de soi même; écrite en Arabe par Jaaphar Ebu Tophail, Philosophe Arabe & Mahometan: Où l'on montre par quels degrez la raison humaine avec le secours de l'experience, & d'un grand nombre d'observations exactes, peut parvenir à la connoissance des choses naturelles, découvrir ensuite les surnaturelles, & à ce qui regarde l'autre vie. Traduite en Anglois sur la Version Latine d'EDOÜARD POCOÛCK, Maître aux Arts dans le College de l'Eglise de Christ à Oxford, in. A Londres.¹⁵⁴

Locke was certainly thinking of Edward Pococke at the time of the publication of the *Essay on Human Understanding*. In the Lovelace Collection, there are, in Locke's hand, lists of persons to whom Locke sent or gave copies of his publications (between 1689/90-1699). These are publications where the authorship is acknowledged by Locke on the title page or during his lifetime.¹⁵⁵ Among the select few who were to be sent the first edition of the *Essay* (1689/90) is 'Pococke, Edward: jnr.' The inclusion of Edward, the translator of the *Philosophus autodidactus*, together with those who were close to Locke, such as Lord Ashley, Lady Masham, Boyle, Le Clerc, Sydenham,

Tyrell, and others, such as Huyghens, is significant. Perhaps it is a subtle recognition of an earlier debt for a copy of the *Philosophus autodidactus* given him in 1671.

CONCLUSIONS

From the material considered, several points clearly emerge. First of all, Locke was engaged in intellectual activities at a time when 'Arabick' interest was high, whether in biblical studies, mathematics, medicine, or astronomy. He was at a College which was central to that interest. Secondly, in addition to his close relationship with the Pocockes, he was also in contact with 'orientalists' and others who were concerned with *Ḥayy ibn Yaqẓān* or the *Philosophus autodidactus*. His activities in Oxford, London, Amsterdam and Rotterdam put him in contact with figures who had a keen interest in the work. In his trip to Paris, for example, he met and remained in correspondence with Melchisédec Thévénot, who had been anxious to get a copy from Dr. Pococke via Vernon, Wallis, and Oldenburg, and who was familiar with the author, Ibn Ṭufayl.¹⁵⁶ Translations and re-editions of *Ḥayy ibn Yaqẓān* continued during Locke's lifetime. Pococke's Latin translation was reprinted in 1700, followed by the reprinting of its Dutch version in 1701, three years before Locke died. (The interest in the work was re-stimulated with a new translation from the Arabic original in 1708.)¹⁵⁷

These circumstances establish beyond any reasonable doubt that Locke had detailed acquaintance with the *Philosophus autodidactus*. He could only have been unaware of it, were he the victim of some gigantic conspiracy [involving Dr. and Edward Pococke to start with; then Oldenburg and the Fellows of the Royal Society; not to mention Furly and Le Clerc] to hide the work from him or to keep him in ignorance of it.

At the same time, it must be mentioned that no direct statement has been found that Locke has read the book or that he owned a copy. The lack of mention of a book is no more an indication of ignorance, than a statement ownership, on its own, would be incontrovertible proof of its having been read.

Nonetheless, the question remains as to why Locke makes no reference to the book. In the face of overwhelming evidence, such an omission seems almost deliberate. It was, in fact, neither unique nor an isolated case when one considers Locke's precarious existence and his cautious and highly suspicious attitude to others.

First of all, the period of the translation and publication of *Ḥayy ibn Yaqẓān*

and the height of Locke's relationship with the Pocockes coincides with the crucial phase of Locke's life between 1667 and 1672, concerning which only 'stray and fragmentary information have come down to us.'¹⁵⁸ Furthermore, although his journals and commonplace books demonstrate his wide reading, Locke was not in the habit of revealing his debt to others by citing all his sources. His references are found to be few.¹⁵⁹ Secondly, Locke was highly secretive. Scholars have found him a very difficult person to write about because of this trait. It is reflected in Locke's 'preoccupation with anonymity' even after he settled back in England, when he had no need to use pseudonyms. When his works were in print, 'only one, the *Essay* was openly acknowledged to have been written by him.' He is described as having an 'inability to be open with the world, his friends, or even with himself about what he has written and why he had written it.'¹⁶⁰ For example, Cranston, describes Locke as 'an elusive subject for a biographer because he was an extremely secretive man.' He would go to extraordinary lengths: 'he modified a system of shorthand for the purposes of concealment; he employed all sorts of curious little ciphers; he cut out signatures and other identifiable names from letters he preserved; at one time he used invisible ink.'¹⁶¹

Among the inventories drawn up of Locke's belongings in London and Oxford, some of which were taken from his rooms at Christ Church, there is one item (recorded along with 'my portrait') which is a trunk marked with the initials 'P.E.'¹⁶² Their identity has been puzzling to scholars, and even described by some as 'romantically mysterious.'¹⁶³ On the basis of the foregoing disclosures, the mystery of the initials can also be resolved. In view of Locke's well-established trick of reversing initials, if one transposes 'P.E.' to 'E.P.', they clearly stand for Edward Pococke. This can be corroborated from Locke's 'journals'. For the year 1681, we have an entry, dated 'Mon., Mar. 7,' which states the arrival of two large trunks from Dr. Pococke 'both full of physique books.'¹⁶⁴ From Locke's 'Journals' we also know that as a physician, he treated 'Mrs. Pococke', Edward's mother, on Sunday Jan. 18, 1680, with a recipe which 'cures even the most violent coughs if taken in the morning three times.'¹⁶⁵ Considering Dr. Pococke's generous nature, his reluctance to impose on even the closest of his friends, the trunks 'full of physique books' could have been a token of his gratitude to Locke.

Locke exemplifies, for the historian, the importance of the seventeenth-century 'Arabick' interest. When such an 'unlikely interest' is seriously considered, a major figure can be seen from an entirely new perspective which brings out an aspect of his intellectual development that had formerly been unknown.

NOTES

¹ The full title is *Philosophus Autodidactus sive Epistola Abi Jaafar ebn Tophail de Hai ebn Yokdhan in qua Ostendur quomodo ex Inferiorum contemplatione ad Superiorum notitiam Ratio humana ascendere possit* (Oxford: A. Hall. Academiae Typographus, 1671). It was reprinted at the Sheldonian Theatre, Oxford in 1700.

² See G. Z. Atal (G. A. Russell), 'Ibn Tufayl's *Hayy ibn Yaqzān*: The First Psychological Novel' in *Texte und Kontexte: Studien zur Deutschen und Vergleichenden Literaturwissenschaft* (Festschrift), eds., M. Durzak, E. Reichmann, U. Weisstein (Bern and Munich: Francke Verlag, 1973), pp. 9-27.

³ For Ibn Tufayl's life, see L. Gauthier, *Ibn Thofail, sa vie ses oeuvres* (Paris: E. Leroux, 1909); and his introduction to the standard Arabic edition and French translation, *Hayy ben Yaqdhān: roman philosophique d'Ibn Thofail*, 2nd ed. (Beirut: Imprimerie Catholique, 1936).

⁴ For Dr. Pococke's professional career see, Foster's *Alumni Oxonienses: The Members of the University of Oxford. 1500-1714* (Oxford, 1891), III, p. 1174; also P. M. Holt, 'An Oxford Arabist: Edward Pococke (1604-91)' in *Studies in the History of the Near East* (London: Frank Cass, 1973), p. 3-73; and 'Edward Pococke (1601-91), the First Laudian Professor of Arabic at Oxford,' *Oxoniensia* (1991), LVI, pp. 119-130.

⁵ See G. A. Russell, 'The Role of Ibn Tufayl, a Moorish Physician, in the Discovery of Childhood in Seventeenth-Century England' in *Child Care Through the Centuries: An Historical Survey*, eds. J. Cule and T. Turner (Cardiff: STS Publishing for the British Society for the History of Medicine, 1986), pp. 166-79; A. Pastor, *The Idea of Robinson Crusoe* (Watford: The Gongora Press, 1930).

⁶ Pococke's reputation derives from a series of publications, among which the *Specimen historiae Arabum* (Oxford, 1648), based on research using Arabic manuscripts, represents a watershed in its attempt to correct some of the erroneous beliefs in the European perception of the Islamic world. See P. M. Holt, 'Arabic Historians in Seventeenth-Century England: The Background and the Work of Edward Pococke,' *Bulletin of the School of Oriental and African Studies* (1957), xix/3, pp. 453-55. (Reprinted in *the Studies in the History of the Near East*).

⁷ L. Twells, *The Theological Works of the Learned Dr. Pocock, To which is prefixed An Account of his Life and Writings never before printed* (London: 1740), I. It includes correspondence which is no longer extant. Subsequent references will be to this volume, cited as *Works*. See also, 'Vogel to Oldenburg' in *The Correspondence of Henry Oldenburg*, eds. A. R. Hall and M. B. Hall (London: Mansel, 1975), XII, 2268, pp. 75-77 and note 1.

⁸ Twells explains (*Works*, p. 3) that because the father wrote the learned Preface, it 'led foreigners, especially those of France to consider the Whole as the Father's Performance.' This wrong attribution has, in fact, continued even in this century with references to the 'Latin translation of Pococke' without identifying which one, as in Gauthier, *Hayy ben Yaqdhān*, p.vii.

⁹ See Twells, *Works*, I, pp. 67-68. Vernon cites such eminent French orientalists as Capellain, Herbelote, De la Croix, and Ferrand and conveys their admiration and enthusiasm for the book.

¹⁰ Later as librarian to Louis the XIVth, Melchisédec was at the centre of the circle associated with the origins of the Académie des Sciences. His academic interest in 'oriental' subjects is realised in a practical way by his nephew, Jean de Thévenot (b. 1633), who travelled in the Near East, Persia and India between 1652 and until his

death in 1665. The account of his travels were published in five volumes, entitled *La Decouverte* (Amsterdam, 1727). For the earlier volumes, see note 179 below. The first volume, *Relation fait d'un Voyage fait au Levant* (Rouen: 1665), which is his Near Eastern travels, was originally edited by his uncle, Melchisédec Thévenot.

¹¹ Twells, *Works*, p. 68. I have not been able to ascertain this 'Life [of Abn Tophail] in Manuscript' unless it is the history of the Maghreb, *al-Mu'jib fi Talkhiṣ Akhbār al-Maghrib* by 'abd al-Wāḥid al-Marrākūshi, the thirteenth-century chronicler of the Muslim West. He gives an account of Ibn Ṭufayl along with Ibn Rushd (Averroes). It is edited by R. Dozy (Leiden, 1881); and translated into French by E. Fagnan as *Histoire des Almohades d'Abd al-Wah'id al-Merrakechi* (Algeria: 1892/3). The possibility of this history as Thévenot's copy is loosely supported by the information supplied by Vernon about Ibn Ṭufayl, that 'he was a Philosopher of great Note and Eminence in his Age, that he was Averroes' Master [Patron], and that he had like to have made a new Sect among the Mahometans, being withal of an active Spirit' in Twells, *Works*, p. 68.

¹² Wallis to Oldenburg, Oxford, 27 Nov. 1671 (MS. W1, no. 1330 and 1833, p. 388 in *The Correspondence of Henry Oldenburg*, ed. & trans. by A. R. Hall and M. B. Hall (Madison and London: Univ. of Wisconsin Press, 1971), III (1671-72), p. 388.

¹³ Oldenburg to Vernon on 4 Dec. 1671: 'I will send him . . . Pocock's *Philosophus autodidactus* for Thévenot.' (from the memorandum in Royal Society MS. V, no. 18, 1836) and a week later: 'Dec. 11 writ to him again; and sent Pococks letter, and y^e Society's being pleas'd with his communication of ph[ilosophical] occur[ences].' (MS V, no. 18) in A. R. and M. B. Hall, *Correspondence*, III, 1836, p. 392 and 1840, p. 397.

¹⁴ Twells, *Works*, I, p. 68.

¹⁵ Twells, *Works*, I, 68. This may be the erudite bibliophile, Lorenzo Panchiàtichi (Florence 1635-76); see *Lessico Universale Italiano Di Lingua Lettere, Arti, Scienze e Technica. Istituto della Enciclopedia Italiana Fondato da Giovanni Treccani* (Roma: 1976). He is also listed in *The World of Classical Scholarship in Italy 1300-800*, ed. Emilio Costenza, III (Boston: 1962) and *The Dictionary of the Italian Humanists*, p. 2566.

¹⁶ This anonymous Dutch translation from Edward Pococke's Latin is entitled *Het Leven van Hai ebn Yokdhan* (Amsterdam, 1672) and went through several editions. For example, when Pococke's Latin was reprinted in 1700, a second edition of the Dutch translation followed in 1701, with the additional title of *De Natuurlyke Wysgeer*.

¹⁷ See Simon Ockley's 'Dedication to the Rev. Mr. Edward Pococke' in his re-translation of the work from the Arabic original, entitled *An Account of the Improvement of Human Reason, exhibited in the Life of Hai ebn Yokdhan* (London, 1708).

¹⁸ February 17, 1672 in Twells, *Works*, I, p. 68.

¹⁹ See Russell, 'Discovery of Childhood,' pp. 171-172.

²⁰ See Gauthier, *Hayy ben Yaqdhān*, p. xxxix-xxxiii; Russell, *Texte und Kontexte*, p. 10-11. An extensive study of the diffusion, translations, and impact of *Hayy ibn Yaqzān* in the seventeenth and eighteenth centuries is in preparation by the present author.

²¹ This translation is discussed later in this paper on pp. 244-47.

²² For details of this translation, see below, note 35.

²³ See below, notes 114 and 115.

²⁴ Letter to M. l'Abbè Nicaise (1697) in *Opera omnia*, ed. L. Dutens (Geneva: Apud Fratres de Tournes, 1768), II, ch. ii, p. 245.

²⁵ For this controversy see, Gauthier, *Hayy ben Yaqdhān*, pp. xxx-xxxii.

²⁶ For an overview of the complex attitudes, see John Redwood, 'Atheists assailed' in *Reason, Ridicule and Religion: The Age of Enlightenment in England 1660-1750* (London: Thames and Hudson, 1976), chap. i, pp. 29-48; he further points out (p. 209): 'many argued that Papists, Turks, and Muhammadans were atheists and that consid-

erable energies were expended in reminding people of the evils of these divergent religious traditions.' Also, C. Hill, *Change and Continuity in Seventeenth-Century England* (Cambridge, Mass.: Harvard University Press, 1975), p. 64; Michael Hunter, 'Science and Heterodoxy: An early modern problem reconsidered' in *Reappraisals of the Scientific Revolution*, ed. David C. Lindberg and Robert Westman (Cambridge: Cambridge University Press, 1990), pp. 437-60.

²⁷ This summary is based on my interpretation of the Arabic text in Gauthier's edition. For a detailed analysis of the content of *Ḥayy ibn Yaqzān*, and relevant bibliography, see G. A. Russell, 'The Rusty Mirror of the Mind': *Ibn Ṭufayl and Avicenna's Psychology*. Monograph Series (Philadelphia: The Transactions of the American Philosophical Society, 1994), forthcoming.

²⁸ See, *The History of Hai Eb'n Yockdan, an Indian Prince: or the Self-Taught Philosopher* (London: S. Alston, for Richard Chiswell and William Thorp, 1686). The long subtitle illustrates how *Ḥayy ibn Yaqzān* was interpreted: 'Written Originally in the Arabick tongue, by *Abi Jaafar Eb'n Tophail*, a Philosopher by Profession and a *Mahometan* by Religion. Wherein is demonstrated, by What Steps and degrees, humane Reason, improved by diligent Observation and Experience, may arrive to the knowledge of natural things, and from thence to the discovery of Supernaturals; more especially of God, and the Concernants of the other World.' For example, in the Introductory *Epistle* to this English version from Pococke's Latin, George Ashwell (1612-95), Rector of Hanwell, Oxfordshire, further summarises the key issues. He hopes that the Philosopher, whose life is here described 'will set an example to the men of this licentious generation' and 'will instruct them in such principles of Morality and Religion, and such alone, as the light of Nature discovers, and which must needs be acknowledged for true by all those, who will judge and act as Men, according to the Dictates of Reason, and the conclusions resulting from Experience.'

He goes further to express his wish that 'All of us were arrived even thus far, by the guidance of this light, and agreed in such principles as humane Reason teacheth out of the Book of Nature, which sets forth to our view God's work of Creation and Providence.' See Note 47 below.

²⁹ The italics are mine.

³⁰ 'Epistle to the Reader' (prefixed to the published edition of *The Essay Concerning Human Understanding* (1689), x.

³¹ H. R. F. Bourne finds in Locke's recollection a 'vague indication of a special subject 'never before considered' and which led to the ultimate elaboration of thoughts that were anything but 'hasty and undigested' in *The Life of John Locke* (London: Henry S. King & Co., 1876), I, p. 249.

³² Maurice Cranston, *John Locke: A Biography* (New York: Longman's Green, and Co., 1957), p. 140-41.

³³ Starting with Locke's nineteenth-century biographer F. Bourne, pp. 148-49, see, for example, Cranston, pp. 140-41; W. von Leyden (ed.), *Essays on the Law of Nature* (Oxford: At the Clarendon Press, 1987; first published 1954), pp. 60-61; A forthcoming volume on the *History of the Composition of The Essay* as vol. II in the Clarendon edition Locke's *Works* has been announced by G. A. J. Rogers which I have not yet seen.

³⁴ *The Philosophical Transactions of the Royal Society*, VI, no. 73 (London: printed for John Martyn at the Bell in St. Pauls Churchyard, 1671), 2214.

³⁵ It is not made clear that the translator is the son and not Dr. Pococke. The statement 'by the care of the Learned Dr. Pocock' leaves it ambiguous.

³⁶ *John Locke - An Essay on Human Understanding*, ed. P. H. Nidditch (Oxford: Clarendon Press, 1975), xiii.

³⁷ Cranston, *John Locke, A Biography*, 140-141; *An Early Draft of Locke's Essay*, eds. R. I. Aaron and J. Gibb (Oxford: At the Clarendon Press, 1936), p. 41.

³⁸ Cranston, *John Locke, A Biography*, pp. 140-41.

³⁹ R. I. Aaron, *John Locke*, 3rd ed. (Oxford: Clarendon Press, 1970). For example, Aaron states that Locke's *New Method of a Commonplace Book*, in the Lovelace collection and Shaftesbury Papers, contain 'many writings on constitutional, political, religious, and moral problems. . . . But never in these early papers, . . . is he concerned with metaphysical matters; nor do those problems of epistemology, to which he was later driven, here disturb him.' He concludes that up to 1667, Locke's main concern was with the practical and the social. 'It is in 1671 that he first bethought himself of the problems of the *Essay* and wrote two important drafts' (pp. 6-7).

⁴⁰ See von Leyden, *Essays on the Law of Nature*, pp. 60-80. His study of Locke's *Lex Naturae* 'in Relation to His Later Works' also supports the 'novelty' of the *Essay*; also, Cranston, *John Locke, A Biography*, p. 65-67.

⁴¹ P. H. Nidditch, G. A. J. Rogers (eds.), *John Locke: Drafts for the Essay Concerning Human Understanding, and Other Philosophical Writings* (Oxford: At the Clarendon Press, 1990), pp. v, xiii.

⁴² Draft 'A' is headed 'Sic Cogitatit de Intellectu humano. [So Jo:Locke anno. 1671 [So Thought John Locke in the year 1671 Concerning Human Understanding]', followed by 'Intellectus humanus cum cognitionis certitudine, et assensus firmitate [Human Understanding with Certainty of Knowledge and Firmness of Assent]'; and Draft 'B' is entitled consecutively as 'Intellectus /1671/J. L. and De Intellectu Humano—An Essay 1671'. For the date of 10 July 1671, which is given within the text on fol. 80, see, *John Locke: Drafts for the Essay Concerning Human Understanding, and Other Philosophical Writings*, eds. Nidditch and Rogers, I, p. 43.

⁴³ Bourne suggests (*Biography*, I, p. 265) that it probably took place in the winter of 1670-71 when Locke 'appears to have resided mainly at Exeter House. Cranston, however, argues (*John Locke*, p. 141) that it could not have been later than the early months of 1671 since Locke was writing a draft in the summer of the same year.

⁴⁴ *John Locke: Drafts for the Essay Concerning Human Understanding and Other Philosophical Writings*, eds. Nidditch and Rogers.

⁴⁵ Locke was also partly in London, and in Wimborne St. Giles. See Cranston, *Biography*, p. 141.

⁴⁶ R. G. Frank, Jr., *Harvey and the Oxford Physiologists* (Berkeley: University of California Press, 1980), pp. xiv, 43-44.

⁴⁷ The translator of Pococke's *Philosophus autodidactus* into English, George Ashwell (1612-1695) was, for example, also from Oxford, a Fellow of Wadham College. See *The Dictionary of National Biography*, I, pp. 656-57 (Henceforth *D.N.B.*). Also M. B. Hall, 'The Royal Society's Role in the Diffusion of Information in the Seventeenth Century,' *Notes and Records of the Royal Society of London*, 29 (1975), 173-92.

⁴⁸ See above, notes 12 and 13.

⁴⁹ The introduction of Arabic into the curriculum was not without acrimonious disagreements with his colleagues; see *Annals of Westminster School* (London, 1898), 86, pp. 1156-61. Richard Busby, known as the 'flogging' headmaster, apparently ruled with a rod of iron. This is reflected in the following epigram on the appointment of Dr. Freind to succeed Busby:

You sons of Westminster who still retain
Your ancient dread of Busby's awful reign
Forget at length your fears—your panic end,
The monarch of the place is now a Freind.

⁵⁰ Wood, *Athenae Oxonienses*, IV, pp. 444-6; and *Fasti Oxonienses*, I, p. 416.

⁵¹ For Bedwell's role in Arabic studies, see the excellent study of Alastair Hamilton, *William Bedwell, the Arabist 1563-1632* (Leiden: E.J. Brill/Leiden University Press, 1985).

⁵² Camb. Univ. Lib., Mm. 1.47 (Baker MSS, 36), 347 in P. M. Holt, *A Seventeenth-Century Defender of Islam: Henry Stubbe (1632-76) and his Book* (London: Dr.

Williams's Trust, 1972), p. 11-12.

⁵³ Busby was also educated at Westminster, and elected in 1624 to studentship at Christ Church, with B.A. in 1628 and M.A. in 1631, remaining a tutor for some time at Christ Church and a provisionally master of Westminster in 1638 and confirmed in 1640. In recognition of his Royalism, he was made Prebendary of Westminster by the King. See *D.N.B.*, I, 874-5; III, pp. 481-3.

⁵⁴ West. Abbey MSS. 43057 in Cranston, *Biography*, p. 21.

⁵⁵ The procedure in Locke's day is described as follows: candidates started in the school order, and the boy at the bottom of the list challenged the boy above him to construe a particular classical author, to parse and to give the rules of grammar and usage for any word he, the challenger, chose. If the boy who was challenged failed, the challenger was promoted to his place. Locke came tenth; see, Cranston, *Biography*, pp. 21-22.

⁵⁶ *The Diary of John Evelyn*, ed. E. S. de Beer, 6 vols. (Oxford, 1955), III, pp. 287-8.

⁵⁷ The letters (B.L. MSS. Locke, c. 34, fols. 165 and 167) are given in full in Cranston, *Biography*, pp. 26-27. In the letter dated 11th May 1652, Locke writes to his father from Westminster: 'I have to my utmost done what lies in me for the preparation both of myself and friends for the Election. . . . Mr. Busby . . . having spoken to the electors on my behalf, and although my Latin oration be not spoken yet, he hath promised that my Hebrew one which I made since, I shall, which I would desire you to be silent of, for there hath been something already spoken abroad more than hath been for my good.'

⁵⁸ For Locke's early education, see Aaron, 'Early Years' in *John Locke*, pp. 1-14; and Cranston, 'The Westminster Boy' in *John Locke*, pp. 18-28. A description of the rigorous 'diet' at Westminster is given by Bourne, I, pp. 20-21.

⁵⁹ John Locke, *Thoughts Concerning Education* (1693). These were written during Locke's exile in Holland as letters to instruct Clarke for the education of his son, and later modified and published several times during Locke's lifetime. For the differences between the 'First Draft' ('Directions concerning Education') and the published edition, see Aaron, *John Locke*, pp. 287-91; Cranston, *Biography*, p. 25.

⁶⁰ See Bourne, *Biography*, I, p. 21.

⁶¹ Among those elected together with Locke, James Carkess, son of James Carkess, the Turkey merchant of London, went on, for example, to become the headmaster of Magdalen College School, Oxford.

⁶² Locke wrote on the question of toleration in 1659 (B.L. MSS. Locke, c. 27, f. 12) and sent them to Henry Stubbe, who had written a pamphlet which was both a history of toleration and a plea for its extension. The pamphlet was entitled, *An account of the rise and progress of Mahometanism with the life of Mahomet and a vindication of him and his religion from the calumnies of the Christians. For an evaluation of its content*, see P. M. Holt, *A Seventeenth-Century Defender of Islam: Henry Stubbe (1632-76) and his Book* (London: Dr. William's Trust, 1972), pp. 9-29. For the interpretation of the initials S. H. on Locke's draft as Henry Stubbe, see Cranston, *Locke*, p. 44.

⁶³ It is of interest to mention that later, as an unsalaried librarian at Christ Church, Prideaux spied on Locke's activities in 1681 by sending reports to the under secretary of state. See Hargreaves and Mawdsley, *Oxford in the Age of Locke*, pp. 117-118.

⁶⁴ Wood, *Athenae Oxonienses*, III, pp. 1133-4 and *Fasti Oxonienses*, pp. 190, 224; Foster, *Alumni Oxon.*

⁶⁵ Twells, *Works*, I, pp. 66-68; also S. P. Rigaud, *The Correspondence of Scientific Men in the Seventeenth Century* (Oxford, 1841), I, 139-41, 151-56, 160-65; 176-79; 186-87; II, pp. 121, 221-22; 243.

⁶⁶ Aaron, *John Locke* (corrected ed. 1963), p. 5. According to *Laud's Statutes of 1636*, the lectures were on Arabic Literature and grammar, and took place at 8:00 a.m. every Wednesday in Lent and during vacations (when the arts course did not fully

occupy the time of the students, who at the time resided in the College both during vacation and term time). All (bachelors) students were required to attend under penalty of a fine. (Griffiths, *Laud's Statutes of 1636*, ed. 1888, pp. 317, 318. *D.N.B.*, 'Pococke', p. 8. Whether this succeeded in practice is unclear. During the Civil Wars, Pococke was given the rectory at Childrey, having lost his canonry of Christ Church in 1650. He was almost deprived of his two lectureships as well. At the time when Locke was attending Christ Church, Pococke came to Oxford during vacations to deliver his courses, Wood, *Athenae Oxonienses*, ed. Philip Bliss, (*An exact history of all the writers and Bishops who have had their education in the University of Oxford.*), 3rd ed. (London: 1820), IV, p. 319.

⁶⁷ The choice of studies seems to have been fairly wide; little more than a mere attendance at lectures and disputations was exacted from the applicants for the mastership; and as the connection with a tutor was no longer necessary, the graduates had the flexibility to utilise their own time and make their own choice of studies. See, Bourne, *Life*, I, pp. 52-53. Locke, however, seems to have been discouraged by all the 'unprofitable reading in which he was expected to engage.' Lady Masham informs Le Clerc that 'This discouragement, he [Locke] said kept him from being any very hard student, and put him upon seeking the company of pleasant and witty men, with whom he likewise took great delight in corresponding by letters; and in conversation and these correspondences, he according to his own account of himself, spent for some time much of his time.' Lady Masham to Le Clerc, 12 Jan. 1704-5 (MSS in the Remonstrants' Library) in Bourne, *Life*, vol. I, p. 53.

⁶⁸ Bourne, *Life*, I, pp. 42, 56. Bourne comments that 'at Oxford having to attend Arabic as well as Hebrew classes twice a week during two or three years, Locke doubtless continued these studies to a moderate extent; but he never won any fame as an oriental scholar.'

⁶⁹ His attendance of his sermons is clear from Locke's recollection of Dr. Pococke: . . . nor Could his Devotion and Piety lie hid, and be unobserv'd in a College where his constant and regular assisting at the Cathedral Service, never interrupted by sharpness of Weather, and scarce restrain'd by down-right want of Health; shew'd the Temper and Disposition of his Mind. . . Locke to [Humfry Smith], 23 July 1703 (3303), *Correspondence*, ed. De Beer, VIII, p. 37.

⁷⁰ Bourne, *Life*, vol. I, 56-59.

⁷¹ See Bourne, *Life*, I, p. 59; Aaron, *Locke*, p. 5; Cranston, *Biography*, p. 73.

⁷² See, *Correspondence*, ed. De Beer, vol. viii, 3303, p. 17.

⁷³ Bourne, *Life*, vol. I, pp. 57-58. It is worth mentioning that among the reasons given which initially put off Locke from pursuing a Bachelor in physic [medicine] at Oxford was the requirement of having to attend Arabic lectures for three years merely for the purpose of learning such 'outworn stuff' as Avicenna's *Canon*. For the circumstances of Locke's Bachelor of Medicine, see *Oxford in the Age of Locke* (Norman: University of Oklahoma Press, 1973), pp. 110-113.

⁷⁴ See *Correspondence*, De Beer, VIII, 3303, p. 17.

⁷⁵ Wood, *Athenae Oxonienses*, IV, p. 319; Twells, *Works*, I, pp. 35-42. *Biographical Dictionary: containing an historical and critical account of the lives and writings of the most eminent persons in every nation; particularly the British and Irish.* . . . ed. Alexander Chalmers (London: 1816), New ed., XXV, pp. 88-89.

⁷⁶ Bernard, as the Savilian Professor of Astronomy, remained in touch with Locke about Dr. Pococke. In a letter dated 28 January 1690, he writes: 'Our freinds at Christchurch are pretty well, especially the aged Doctor.' See *Correspondence*, ed. De Beer, III, no. 1241, p. 798.

⁷⁷ These were al-Maydāni's collection of 6,013 Arabic proverbs (Bodl., MS. Poc. 392. *Meidanii Proverbia*) which Pococke had brought back from Aleppo in 1636. His Latin translation and commentary was never published. According to *D.N.B.* (vol. X, pp. 279-80), specimens were published by the Dutch orientalist H. A. Schultens,

entitled *Specimen proverbiorum Meidanii ex versione Pocockiana* (London, 1773), and dedicated to Thomas Hunt, the Laudian Professor. For a further description of Pococke's manuscript, see Holt, 'Pococke' in *Studies*, pp. 5; 21-22; 23, n.10.

⁷⁸ Thomas Hearne, *Remarks and Collections of Thomas Hearne*, 11 vols. (Oxford: The Clarendon Press 1885-1927), p. 240. The entry, dated May 5, 1708, indicates that this project was never completed. Attempts were made subsequently to continue it also failed for a number of reasons, not the least being lack of funding: 'Some years since Dr. Pocock made or at least began a Translation of a Curious manuscript amongst his collection of Arabick Proverbs, but it being not ever published and nobody now knowing where it is. . . . attempt by Mr. Marshall—but no money since Mr. Hyde's death.' Also, Twells, *Works*, I, pp. 62-65.

⁷⁹ Twells, *Works*, I, p. 83.

⁸⁰ *A Collection of Several Pieces of Mr. John Locke, Never Before Printed or not extant in his Works* (London, 1720), 332-43; *Correspondence*, ed. De Beer, vol. VIII, no. 3321, dated 23 July 1703, p. 37.

⁸¹ Humfrey Smith to Locke, 17 March 1704 (B.L., MS. Locke c. 18) in *The Correspondence*, ed. De Beer, vol. VIII, no. 3494, pp. 248-249. Locke answered on May 12.

⁸² See Letter no.3322, addressed to [Richard King] and dated 23 July 1703 in *Correspondence*, ed. De Beer, VIII, p. 42. Its earlier printed version in *The Works of John Locke, E. Esq.*, III (London, 1714) has variations from De Beer.

⁸³ See, Cranston, 'The Oxford Tutor,' *Biography*, ch. vi, p. 70.

⁸⁴ For his serious consideration of entering the Church, before abandoning it in 1666, see Bourne, *Life*, I, pp. 89-99.

⁸⁵ His matriculation date is given as 30 May 1661 in J. Foster, *Alumni Oxonienses: 1500-1714*, III (Oxford, 1891); also in Clarke, *Life and Times of Wood*, III, p. 373; and Hearne, *Remarks*, p. 224.

⁸⁶ Cranston, *A Biography*, p. 71. Also, 'Account books of John Locke, 1649-74 (Commonplace Book, B.L., MSS. Locke, F11) kept at Westminster and at Oxford, including accounts of money received from and disbursed to his pupils at Christ Church (for 1661-66) in Peter Long, *A Summary Catalogue of the Lovelace Collection of the Papers of John Locke in the Bodleian Library* (Oxford University Press, 1959), p. 23.

⁸⁷ Cranston, *A Biography*, p. 71

⁸⁸ When Locke was a student himself, pupils had to pay nightly visits to their tutors to hear private prayers and to give an account of the time they spent that day. See Hargreaves and Mawsdley, *The Age of Locke*, pp. 95-96.

⁸⁹ For the closely supervised student life in Locke's own experience as an undergraduate, see Cranston, *A Biography*, pp. 30-31.

⁹⁰ Letters from the parents of Locke's pupils in the years 1662-65, clearly indicate what was expected of him as tutor. *Correspondence*, De Beer, vol. I, Nos. 136, 137, 140, 147, pp. 193-197; nos. 170, 171, pp. 220-224.

⁹¹ The details of his education are listed as follows: Christ Church, matriculated, 30 May 1661; student 1661; B.A. 3 Feb. 1664-65; M.A. 14 March 1667-68. See Foster, *Alumni Oxonienses*, III.

⁹² Shaftesbury papers (series viii, no. 22) include a testimonial of good character for Locke, from the Dean and Canon of Christ Church which is signed by J. Fell, R. Gardiner, and E. Pococke. It is reproduced in Bourne, *Life*, I, p. 88.

⁹³ Nothing, however, seems to have come of it, judging by the reference to Prideaux's subsequent publication of Maimonides (in Hebrew with a Latin version, *De Jure Pauperis et Peregrini*, . . . and notes) in 1679.

⁹⁴ On the basis of this letter, Twells seems to think (*Works*, I, p. 69) that the Maimonides' text mentioned here was *More Nebochim*. He states that from one of Castell's letters 'it appears also that Dr. Pocock was then thought to be preparing

something of Rabbi *Tanchum* and Maimonides' *More Nebochim*, for the Publick. . . But for the latter, I rather take it to have been the Design of the Doctor's eldest Son, Mr. Edward Pococke.'

⁹⁵ From Twells' reference, 'about this time' appears to be sometime after March 1671/72. Edward, however, became Canon of Sarum in 1675. Therefore Locke could not have engaged him in Salisbury before that date. More research is required to verify the dates given in Twells.

⁹⁶ Dr. Pococke was also an authority on Maimonides, having published an edition of Maimonides' six discourses upon the Mishna, entitled *Porta Moses* in 1655; see Twells, *Works*, I, p. 44.

⁹⁷ Subsequently, Edward collaborated with his father on a text of the Latin translation of *Abdullatiphi, Historiae Aegypti Compendium*, the manuscript of which was among those brought back from Syria by Dr. Pococke. A project which, according to Hearne was never completed because just when the printing had started, the Latin type of the University press was required by Bishop Fell for his own purposes. As a result, the translation of the Pocockes had to be stopped: 'which so vexed the good old man Dr. Pococke that he could never be prevailed to go on any further.' The 'proposals' for printing the *Abdullatiphi Compendium* by subscription were also written by Edward (Thomas Hearne, *Remarks and Collections*, ed. Doble (Oxford Historical Society, 1907) I, p. 224; II, p. 63.

⁹⁸ Edward was appointed chaplain to Earl of Pembroke (Clarke, *Life and Times of Wood*, III, p. 373. He was 'beneficed in Bek.' Canon of Sarum 1675; and rector of Mildenhall, Wilt. 1692 until his death in 1727, see Wood's *Athenae Oxonienses*, IV, p. 651. Edward's translation of *Ḥayy ibn Yaqzān* is correctly mentioned as having been 'done in Arabic and Latin with the help of his father.'

⁹⁹ Hearne, *Remarks and Collections*, II, p. 63. He was bypassed for the Arabick chair for someone who apparently 'if ever he understood the language may be suppos'd now to have forgot it, he having the company of one that keeps much company and few Books entirely neglecting his studies.' Dr. Pococke's successor was Thomas Hyde (1636-1703) whose main interest was not Arabic but Persian. It is tentatively suggested that this preferment may have been due to rumours that Edward dabbled in magic and the occult, and even that 'he was the head of the Rosicrucians'. See, Pastor, *The Idea of Robinson Crusoe*, p. 186. It remains, however, a conjecture, and needs to be substantiated.

¹⁰⁰ When Simon Ockley made the first translation (excluding Dr. Pococke's initial attempt) into English from the original Arabick, entitled *The Improvement of Human Reason* in 1708, Edward was still alive. Ockley is unique in paying him tribute as 'the first and best Master' of *Ḥayy Ibn Yaqzān*, 'with whose Character and Language you are so well acquainted, and to whom you have long ago shown so great a Respect.' He refers to him as 'the worthy Son of so great a Father.' The homage he pays Edward is worth quoting in part: 'Hai Ebn Yokdhan . . . acknowledges you as his first and best Master; and confesses, that his being put in a Capacity to travel thro' Europe, is owing to your Hand.'

¹⁰¹ The italics are mine.

¹⁰² 'Letter to Mr. Smith, July 1703 of Dartmouth, who was collecting materials for a life of Dr. Pococke' in *A Collection of Several Pieces* (1720), p. 337; *Correspondence*, ed. De Beer, VIII, p. 37.

¹⁰³ The following quotations are all from Locke's obituary letter; see *The Remains of John Locke*, 1714, pp.1-6; *A Collection of Several Pieces*, pp. 332-43; 'Locke to Humfry Smith', 23 July 1703, 3321 in De Beer, *Correspondence*, VIII, p. 37. (Extracts are also printed in Twells, *Works*, 1740, I, pp. 83-4.

¹⁰⁴ This is implied in his letter to Locke, dated [19 June 1703 ?] where he states: 'in the Account I am drawing up of his Life, his Sons having put his Papers into my hands for that purpose.' See *Correspondence*, ed. De Beer, vol. VIII, letter no. 3303,

p. 17; also according to Hearne, *Remarks and Collections*, II, 4f, p. 10 in *D.N.B.*, XVI, p. 12), the 'Life of Dr. Pococke' was undertaken by Humphrey (Humfry) Smith together with Edward Pococke. It was expected to be completed by 1707, but never finished and later, with additional materials, used by Leonard Twells in the preparation of his biographical introduction prefixed to *The Theological Works of Dr. Pococke*.

¹⁰⁵ (MS. Poc. 429: English Fragments), Bodleian, ff. 1, 2, 16, 17). There is no evidence that anyone was aware of this translation. Ockley's translation is independent of it. It is not mentioned in Twells' biography of Pococke. Nor is there a reference to it in the Dr. Pococke's 'Preface' to his son's Latin translation, where he states that the translation was undertaken with his persuasion and encouragement. I am grateful to P. M. Holt for initially drawing my attention to the existence of this manuscript.

¹⁰⁶ Aaron, *John Locke*, p. 7. Aaron emphasizes that in the Lovelace Collection and *Shaftesbury Papers*, Locke's main concern is practical and social unless some of the essays on the 'Law of Nature' (Bodl. MS. Locke, fol. 31) are held to be epistemological.

¹⁰⁷ Aaron, *John Locke*, p. 24.

¹⁰⁸ For a description of the nature, size, and the history of the collection, see *The Library of J. Locke*, ed. John Harrison and P. Laslett (Oxford: At the Clarendon Press, 1971), particularly the introductory essay, 'John Locke and His Books,' pp. 1-54.

¹⁰⁹ Harrison and Laslett, *Library*, p. 16.

¹¹⁰ Harrison and Laslett, *Library*, p. 3.

¹¹¹ For such gifts of books lost sight of and not mentioned, see Harrison and Laslett, *Library*, pp. 11 and 44.

¹¹² For the difficulties of Locke in preserving his books, see Harrison and Laslett, 'John Locke and his Books,' esp. pp. 1-11.

¹¹³ Listed under no. 2302 in Harrison and Laslett, *Library*, p. 209.

¹¹⁴ Baltasar Gracian, *L'Homme de Cour* (Ha: 1685), 372 pp. It is listed as no. 1304 in Harrison and Laslett, *Library*, p. 146.

¹¹⁵ Paul Rycaut, 'The Translator to the Reader' in *The Critick* (London, 1681) where he also explains that he undertook the translation while in Spain (1652) as an exercise in mastering the language. Part one of the Spanish work was published (Zaragossa, 1651) by Baltasar Gracian y Morales (1601-1658) under a pseudonym in defiance of his superiors at the Jesuit College of Tarragona. See, A. F. G. Bell, *Baltasar Gracian* (1921). Rycaut spent seventeen years in the Middle East and wrote a number of books on the Jews, the Greek and Armenian Churches, as well as the well-known *Present state of the Ottoman Empire*, based on first hand accounts; see, Sonia P. Anderson, *An English Consul in Turkey: Paul Rycaut at Smyrna (1667-78)* (Oxford: Clarendon Press, 1989).

¹¹⁶ *L'Alcoran de Mahomet*. Translate d'Arabe en Fran(çais) par le sieur du Ryer. 4° (Paris, 1647) in Harrison and Laslett, *Locke's Library*, entry no. 52, p. 70.

¹¹⁷ Gregorius Abulpharagius, *Historia compendiosa dynastiarum*. Arabic ed. and Latin trans., 3 pts., (Oxford, 1663) in Harrison and Laslett, *Library*, no. 5, p. 67.

¹¹⁸ E. Pococke, *Commentary on Micah*, fol. (Oxford [16]77); *Commentary on Hosea*, fol. (Oxford [16]85); *Commentary on Joel*, fol. (Oxford [16]91) listed in Harrison and Laslett, *Library*, no. 2361, p. 212.

¹¹⁹ Some of these books could have been part of the required textbooks used by Dr. Pococke in teaching Arabic and Hebrew at Christ's Church. For the material Pococke used for teaching, Hebrew and Arabic, including his lecture notes which survive, see, Holt, *Studies*, chap. 1, esp. pp. 7; 12-13.

¹²⁰ In Locke's *Library*, the dates of the works range from 1675 to 1694; for Keith, see the following entries 1614-1624, p. 165; and 2414, 2421, p. 216; for Barclay, entries 201-202, pp. 79-80. The titles for Robert Barclay (dated 1675, 1676, 1683)

include his most important work, *Apologie for y^e true X^{ian} Divinity as held forth by the Quakers* (London, [16]78). For additional titles on the Quakers, see entries 2412-2421, p. 216.

¹²¹ For Locke's early attitude to the Quakers, see *The Correspondence*, ed. De Beer, I, pp. 41-2; 83-4; 126; Cranston, *Locke*, pp. 40-41.

¹²² *An Account of Oriental Philosophy, shewing the Wisdom of some Renowned Men of the East; and particularly, The profound Wisdom of Hai Ebn Yokdan, both in natural and Divine things; Which he attained without Converse with Men, (while he lived on an Island a solitary life, remote from all Men from his Infancy, till he arrived at such perfection). Writ Originally in Arabick translated into Latine by Edward Pocock, a Student in Oxford; And now faithfully out of his Latine, Translated into English for a General Service* (1674). See also, Joseph Smith's *Catalogue of Friends Books*, II, pp. 18-50. Suppl. 210. The name of the translator is not given on the title page.

¹²³ Listed as Georgius Kethus, the Quaker controversialist (July, 1658) in *Selections from the Mariscal College and University of Aberdeen (1593-1860)*, ed. P. J. Anderson, II (Officers, Graduates, and Alumni) (Aberdeen: 1898), p. 222.

¹²⁴ For a contemporary outline of Keith's career, see Gerard Croese, *Historiae Quakeriana* (Amsterdam, 1695), pp. 191-92. (1696) Part 1, p. 150.

¹²⁵ 'Advertisement to the Reader,' *Hai Ebn Yokdan*. It is not realised that the first translation into English from Pococke's Latin was made by Keith. Priority is wrongly given to George Ashwell; see Wood's *Athenae Oxonienses*, IV, p. 651.

¹²⁶ 'Advertisement to the Reader,' *Hai Ebn Yokdan*.

¹²⁷ For Robert Barclay, see *D.N.B.*, pp. 1087-90.

¹²⁸ The title is *Theologiae vere Christianae apologia* (Amsterdam, 1676). (One is reminded of the nine hundred theses of Pico della Mirandola (1463-1494) of an earlier period and his *Apologia* in their defense. Pico della Mirandola, in his concern with exalting the dignity of man, was also interested in the Arabic narrative through its Hebrew translation. Pico della Mirandola's contemporary biography and some of his letters were available in English through Thomas More's translation. See P. O. Kristeller, 'Introduction to a translation of Pico's Oration on the Dignity of Man' in E. Cassirer, P. O. Kristeller, and J. H. Randall, jr., *The Renaissance Philosophy of Man* (Chicago, 1948).

¹²⁹ The assertion in the *D.N.B.* (vol. I, p. 657) that George Ashwell's English translation of *The History of Hai Eb'n Yockdan*, 'is remarkable for having supplied Robert Barclay with a proof of his doctrine of 'inner light' is entirely wrong. Ashwell's translation from Pocockes' Latin was published in 1686 which places it after Keith's translation in 1674 and twelve years after the publication of the *Apology*.

¹³⁰ Robert Barclay, *An Apologie for the True Christian Divinity, As the same is held forth and preached by the people, called in Scorn, Quakers. Being a full explanation and vindication of their Principles and Doctrines, by many arguments, deduced from Scriptur (sic) and right Reason and the testimonys of famous Authors, both ancient and modern with a full answer to the strongest objections usually made against them. Presented to the King. Written and published in Latine, for the information of Strangers, by Robert Barclay. And now put in our own language, for the benefit of his countrey-men.* 4th (London, 1678), Prop. v and vi, Parag. 27, p. 134. The earlier editions in *Locke's Library*, are dated as 1675, 1676, 1683; see note 119 above.

¹³¹ *Apology*, par. 27, p. 134.

¹³² See, G. Keith, *The Standard of the Quakers examined* (1702), p. 5. Written after Keith had become an Anglican, it is both a criticism of *The Apology* and an account of Keith's share in its preparation.

¹³³ Unlike Pococke, 'the ornament of Oxford', Keith seems to have been a controversial figure. In later life, he became a thorn in the side of the Quakers, earning many labels in such pamphlets as *Mr. Keith no Presbyterian nor Quaker; but*

George the Apostate (1696). For an illustration of the sort of polemical writings, see G. K. [George Keith]'s *Complaint against the Quakers or an Answer to the Quaker's complaint against G. K.* (1700).

¹³⁴ It has also been translated into Spanish, Danish, and curiously in part into Arabic and is described not only as 'the first defense of Quaker principles by a man of trained intelligence', but also as 'one of the most impressive theological writings of the [seventeenth] century'. *D.N.B.*, pp., 1089-1090.

¹³⁵ See G. A. Russell, 'The Role of Ibn Tufayl, A Moorish Physician, in the Discovery of Childhood in Seventeenth-Century Britain' in *Child Care Through the Centuries*, ed. Cule and Turner, esp. pp. 171-173.

¹³⁶ Wood's *Athenae Oxonienses.*, ii, pp. 911-12.

¹³⁷ See, for example, his discussion of 'Defense of Nonconformity' in the 'Abstracts from His Correspondence, Journals, and Commonplace Books' published by Lord [Peter] King, *Life of John Locke* (London: Henry Colburn and Richard Bentley, 1830), II, pp. 196-218.

¹³⁸ Harrison and Laslett, *Library*, p. 79; see note 119 above.

¹³⁹ See 'Furly', *D.N.B.*, p. 770; also De Beer, *Correspondence*, III, pp. 39-40; Cranston, *Biography*, p. 282.

¹⁴⁰ William Penn, for example, who founded the colony of 'Pennsylvania', as a model society, a Quaker Utopia, gave a copy of its constitution, which he drafted, to Locke in 1686. For Locke's comments in his *Journal*, see Cranston, *Locke*, pp. 260-61. Penn was also an Oxford man but expelled by the Anglicans.

¹⁴¹ For example, they sailed to Holland on July 25, 1677 and to Germany on 6th August with Benjamin Furly; *D.N.B.*, p. 1207.

¹⁴² A Catalogue, *Bibliotheca Furliana* (Rotterdam: Fritsch and Bohm, 1714) was produced after Furly's death for the auctioning of his impressive collection of books.

¹⁴³ Although it is not clear how far back their acquaintance goes, Furly assisted Keith in writing 'The Universal True Grace of the Gospel Asserted' and translated several works from Dutch into English. It is a reasonable assumption, therefore, that Furly was responsible for the Dutch copy of the *Philosophus autodidactus* which, on Keith's own admission (in the 'Advertisement to the Reader'), 'came' his way.

¹⁴⁴ Philip von Limborch was the grand-nephew of Episcopius, the founder of the Remonstrants' Church in Amsterdam (1630), who stood against the prevailing Dutch Calvinism and for a broader church based on full liberty of belief. As the leader of the Remonstrants in Holland, he had become one of the most important and widely known theologians at the time. He is also one of the figures who influenced Locke, particularly, on the question of 'toleration' which was being debated in Holland. Locke's *Epistola de Tolerantia* was written to Limborch in the winter of 1685-6 and published in 1689.

¹⁴⁵ This was followed by his *Bibliothèque Choisie* (Amsterdam, H. Schelte, 1703-1713) in 28 vols. and *Bibliothèque ancienne et moderne* (1714-26) in 29 vols. Le Clerc was concerned with the necessity of a more scholarly inquiry into the origin and meaning of Biblical books. Through these journals, he exercised wide influence.

¹⁴⁶ *Bibliothèque*, III, pp. 76-98.

¹⁴⁷ *Bibliothèque Universelle*, II (1686), pp. 315-340.

¹⁴⁸ Aaron, pp. 22-23. The July issue containing Locke's article included that for August as well. De Beer suggests (*Correspondence*, III, p. 39, note 1) that it was unlikely for it to have been published until September.

¹⁴⁹ For details, see note 35 above.

¹⁵⁰ Aaron, *John Locke*, p. 24.

¹⁵¹ Bourne, *Life of John Locke*, II, p. 44-45.

¹⁵² See, Bourne, *Life*, II, 45, note 1. Bourne also asserts that the reviews of English books were 'contributed by someone well acquainted with our language and literature. Unless by Le Clerc himself, who knew English, it is difficult to understand by whom they could have been written unless by Locke himself.'

¹⁵³ *Bibliothèque*, 8 (January 1687/88), pp. 49-142. For the circumstances of Locke's publication of the *epitome* and his contributions to Le Clerc's journal, see Cranston, *Locke*, pp. 288-293. The fact that Locke wrote everything which was published between July 1687 and February 1688 has been established on the basis of Locke's indication of his work in his own copies of the vols. VI-VIII of the *Bibliothèque*.

¹⁵⁴ *Bibliothèque*, III, pp. 76-77. Ashwell's translation is entitled, *The History of Hai Eb'n Yockdan, an Indian Prince: or the Self-Taught Philosopher* (London: S. Alston, for Richard Chiswell and William Thorp, 1686); see note 35 above. It is significant that in the French review, Ashwell's insertion of 'an Indian Prince'—which is not relevant—has been removed from the title. It suggests the editorial hand of someone (such as Locke) who knew Pococke's version.

¹⁵⁵ The list is printed in the *Correspondence*, ed. De Beer, VIII, Appendix II, p. 457. It also includes in addition to Furly, and Le Clerc, a copy to Christ Church from which Locke was expelled by losing his studentship.

¹⁵⁶ Locke's library has numerous copies (1663-81) of *Relation d'un voyage fait au Levant*, edited by Melchisédec Thévenot. For copies of *Relations de Divers voyages curieux* (Paris, [16]63), I, see Harrison and Laslett, *Library*, nos 2888-2890, p. 247. Also note 1 above.

¹⁵⁷ The present author is preparing an extensive book on the Philosophus autodidactus and the impact of its translations on the seventeenth and eighteenth centuries.

¹⁵⁸ Bourne, *Life of John Locke*, vol I, p. 245.

¹⁵⁹ Aaron, *Locke*, pp. 7-11.

¹⁶⁰ Harrison and Laslett, *Library*, p. 5.

¹⁶¹ Cranston, *A Biography*, p. xi.

¹⁶² Cranston, *A Biography*, p. 161.

¹⁶³ The identity of these initials is not to be confused with those in Locke's correspondence in his early Oxford years, which Cranston interprets in 'romantic' terms, see *Biography*, p. 47.

¹⁶⁴ B.L. MS. Locke, fol. 5.

¹⁶⁵ B.L. MS. Locke, fol. 4. For his medical training, practice, and notes in his 'Journals', see K. Dewhurst, *John Locke: Physician and Philosopher. A Medical Biography* (London: The Wellcome Historical Medical Library, 1963).

ANDREW WEAR

ENGLISH MEDICAL WRITERS AND THEIR INTEREST IN
CLASSICAL ARABIC MEDICINE
IN THE SEVENTEENTH CENTURY

In 1539 Sir Thomas Elyot wrote by way of introduction to his *Castel of Health*:

And afterward by mine own study, I read over in order the most part of the works of Hippocrates, Galen, Oribasius, Paulus Caelius, Alexander Trallianus, Celsus, Plinius and one and the other, with Dioscorides. Nor did I omit to read the long Canons of Avicenna, the commentaries of Averroes the practises of Isaac, Haly Abbas, Rasis, Mesue, and also of the more part of them which were their aggregators and followers.¹

Such enthusiasm for Arabic medicine was to be rare in England in the century that followed. The reasons for this are relatively easy to discern. In European terms Elyot already was becoming old-fashioned. The sixteenth century saw the near demise of Arabic medicine. The humanists, led by men such as Leonicensio, Manardi and Fuchs, rejected the Arabic and the medieval Latin writers. The retrieval of a *prisca medicina* based on Hippocrates and Galen necessitated the rejection, in principle at least, of all intermediary writers. The latter, it was thought, had not only clouded the pure fount of medicine with regard to content, but had also spoiled the language of medicine with barbarous non-classical, neologisms.

However, despite protestations of principle, knowledge of Arabic medicine was quite widespread amongst European, and especially Italian, medical writers. Avicenna's *Canon*, for instance, with its useful paraphrase of Galenic doctrines remained in the medical curriculum until the eighteenth century. Apart from the traditional inertia of pedagogy, the very scholarship of the humanist medical writers ensured that Arabic medicine stayed alive in renaissance Europe. Moreover, some of them tried to modernise the Arabic texts by stylistically improving the old Latin translations and 'correcting' them in the light of Greek medicine, examples of this are Vesalius' *Paraphrasis in nonum librum Rhazae* (1537), the editions of Avicenna's *Canon* by Rinio, Graziolo and Costeo and the acerbic *Expositio* by Montanus of Rhasis' ninth book *ad Almansorem*. As Nancy Siraisi has pointed out, this was the fruit of classical rather than Arabic scholarship.²

When, in the seventeenth century, Arabic scholars such as Peter Kirsten, Vobiscus Plemp, Pierre Vatie and Georg Welsch translated and published parts of the *Canon* directly from the Arabic, 'the context that made their work possible was the seventeenth-century flowering of Arabic studies rather than any developments in the world of medical learning'.³ In fact, in the seventeenth century the impact of Arabic medicine in West European medicine, so large in the middle ages and into the renaissance, dried up.

Seventeenth-century England mirrored this situation even more clearly. English medicine had a few scholars in the sixteenth century like Linacre, Caius and Wootton to represent it amongst the humanists, and humanism had influenced the London College of Physicians which specified only Hippocrates and Galen for its examinations and excluded Arabic and medieval authors. By and large, renaissance medicine came to England at second hand, in the form of popularisations and translations. Despite William Harvey (who after all was formed in Padua), English medicine was a relative backwater until at least the mid seventeenth century. This, coupled later in the century with the rejection of tradition and authority in the form of Galenic, and hence Arabic medicine, and its replacement by chemical and mechanical/corpuscular theories, means that a paper on the interest in Arabic medicine by seventeenth-century English medical writers will have to consist of bits and pieces dredged from a wide range of sources. What we are dealing with are the traces of a once influential medical system though, as M. B. Hall points out in chapter viii, there was a continuing interest in contemporary remedies used in the Middle East as opposed to classical Arabic medicine.

The sense of distance between Arabic medicine and English early modern medicine is very apparent. Arabic medicine was known to Europe in Latin translation; but English medical writers began to write in their own tongue. Thomas Phayre justified the practice:

For if Galen the Prince of this art being a Grecian wrote in the Greek, king Avicine of Arabia in the speech of the Arabians, Celsus, Serenus and other of the Latins wrote to the people in the latin tongue ... What reason is it, that we should hurther murther have among a few, the thing that was made to be common to all.⁴

Andrew Boorde in his *Breviary of Health* (1547) associated Greeks, Arabs and Latins with obscurity; writing in English was to be the key to understanding:

But for as much as old ancient authentic authors or doctors of physic, in their books, doth write many obscure terms, giving also to many and divers infirmities, dark and hard names, difficult to understand, some and most of all being Greek words, and some and few being Araby words, some being latin words, and some being barbarous words. Therefore I have translated all such

obscure words and names into English that every man openly and apartly may understand them.⁵

The common link through Latin between Arabic and English writers was loosened largely by the vernacular and nationalist tendencies of English medicine. The very large number of medical books written in English in the seventeenth-century were not merely popularisations of academic, classically based, medical knowledge, but produced a new genre of medical writing which, by its huge output, came to dominate English medicine.⁶ One of its characteristics was an emphasis on English medicines for English bodies and ills. This nationalistic and essentially local point of view, implicitly hostile to Arabic medicine, was expressed early on by Timothy Bright in his *Treatise Wherein is declared the sufficiency of English Medicines* (1580) and plagiarised later in Nicholas Culpeper's *School of Physick* (1659).

Bright produced a sustained argument for English medicines. He admitted that foreign, exotic lands were commonly seen as the source of medicines:

But saith one, the East and West Indies, Arabia, Barbarie, the Red Sea are the mines as it were, and the fountains of medicines; and Spain, Portugal and Venice the vents of such things and Navigation the means to obtain them.⁷

For Bright such remedies were 'things rather of superfluous pleasure than necessary reliefs and serving rather for a certain pomp than for maintance of life', (in fact, such remedies remained very popular—in 1704 Robert Pitt wrote that the 'public has been grievously imposed on by the Arabian cookery of the natural medicines', and complained of their expense and complexity).⁸ More specifically, Bright wrote:

Nay which is yet more absurd that the health of so many Christian nations should hang upon the courtesy of those heathen and barbarous nations, to whom nothing is more odious than the very name of Christianity? And who of malice do withhold from us such medicines, as they know most for our use? Whereupon the Turk denieth unto the Christians at this day the *Terra Lemnia*, a medicine to be preferred before the chief of those we persuade ourselves to enjoy. The corruption of their drugs, is it not so great, that in this light of all knowledge, scarce is one able to discern the right *Bolus Armena* from the ocre of Apulia, or to discover the adulterating of ambergreece and musk. . . tamarinds are counterfeited with prunes. . .⁹

Bright also found theoretical reasons for dismissing foreign medicines. Not only did individuals have different temperaments or complexions (balance of humours), but so did nations—a view held since the Hippocratic treatise *Airs, Waters, Places*:

Neither do I see why the medicines of India or Egypt should be laid upon us, more than the Indian or Egyptian diet, which is to eat lizards, dragons and

crocodiles: for if the proper medicine doth always regard his proper adversary which causeth the disease (as no doubt it should do) then there being a great difference betwixt our humors and theirs, as much as in a manner as is betwixt the flesh of a crocodile and of a tender capon, our medicines which are so to fit us, must needs be of another kind than theirs, which in our bodies not finding such humors and excrements, as that strange diet doth ingender must need seize upon the very substance of our bodies to have somewhat to work upon: which painfull working especially of the purgers, causeth the common saying among the people to the great discredit of our art: there is not a purgation but it hath a smack of poison.¹⁰

The universalism of classical medicine, into which Arabic medicine was incorporated, was thus not only threatened by the loss of its universal language, Latin, but also by the doctrine of national remedies for each nation. As the use of the English language was justified by appealing to ancient examples (the Greeks wrote in Greek for Greeks etc.) so Bright justified his position by showing that ancient medicine had also been local (something which humanist medical writers had done implicitly when they discovered that the herbs of Dioscorides were not always those of North Europe):

The whole art of physic hath been taken partly from the Greeks and partly from the Arabians. And as the precepts of the art, so likewise the means and instruments wherewith for the most part the precepts of the same art are executed: which hath bred this error in times past, now by a tradition received, that all the duty of the physician touching restoring health, is to be performed by the same remedies, not in kind only, but even especially with those which the Grecian and Arabian masters used, who wrote not for us, but for their Greeks and Arabics, tempering their medicines to their estates.¹¹

Bright shied away, at first, from concluding that the rules of medicine, as opposed to its remedies, were also limited and local: 'their rules be as common as reason to all nations' Yet a few sentences later he came close to it:

Galen saith in his first book of preserving health he giveth the rules thereof no more to Germans than to boars and bears, but to the Grecians. which declareth, they respected their own nation both in rule and medicine; whom also the Arabians in the same point followed.¹²

Bright's position was an extreme one, but it does help us to understand why Arabic medicine was of no great interest to many English medical writers. The idea that only national remedies would cure a nation's ills, was quite widespread. It can be found also in French seventeenth-century books on medicine for the poor (cheapness of remedies being an obvious result of such a view), and in the early seventeenth century literature coming from the American settlements where New England was portrayed as a place fit for English bodies and their temperaments, and as having similar herbal remedies

to those found in England. The sense of distance from Arabic medicine was produced by the English nationalism of the period and by the conscious attempt to make medicine more available in terms of language, knowledge and remedies to a large number of people.

However, this distance also applied to Greek writers. Many English writers on practical medicine gave an anonymous compendium, as it were, of the teachings of previous writers. Phayre, in his *Treatise of the Pestilence*, referred to very few authorities and only a few times (for instance, Dioscorides, p.49r; Constantine the African, p.52v; Galen, 55v; Monardus, 56v; Monardus, Ficino, 59r.) He cited Avicenna once:

Excess of women is exceeding perilous, but if ye cannot rule your self take good heed, ye do nothing afore the first digestion, and till nature doth provoke you, for every such excess weakeneth more the body, than if ye should be let blood forty times as much, as witnesseth Avicenna, and is cause many times of pestilence and death.¹³

The Arabic writers, together with the Greek, seem to have become sources for gnomic, semi wondrous wisdom, attesting through their persons not to whole bodies of doctrine but to isolated pieces of efficacious knowledge. Phayre, in the *Book of Children* (1530?) introduced the remedy for limbs that were cold and could not feel anything with: 'And here is to be noted a wonderful secret of nature, many times approved, written of Avicen in his first Canon' [do not heat the limb, put it in cold, clear water].¹⁴ To cure the appetite we have: 'Rasis a solemn practitioner among physitions, affirmeth that he healed a great multitude of this disease, only with the practise following . . .' Or again: 'Henbane Avicen saith: is exceeding good to resolve the hardness of the stones by a secret virtue'.¹⁵ The tendency for English medical writers to write in an empirical rather than in a theoretical or rational vein probably added to the parcelling out of Arabic and Greek medical knowledge.

There were exceptions. Phillip Barrough in his *The Method of Physick* (1583) looked back, as did the title of his book, to Continental humanistic models. In his Preface Barrough mentioned Avicenna together with Hippocrates, Galen, Aegineta, Aetius and Soranus as not being among the common physicians. Yet he was not sympathetic to the Arab writers, whom he saw as creating difficulties for the nomenclature and understanding of diseases. Here is a typical passage to illustrate the confusion of terminology:

Among this hard swelling kind of tumours are accounted the diseases called in the Latin tongue of the interpreter of Avicen, *verrucae*, which be swellings like unto little hillocks appearing on the skin, being called by the comon sort porra. To this kind also may be referred *myrmeciae*... in which of our countrymen are called *pensiles verrucae* and *clavus* also, which in form is like a hard round pillar called of the Greeks $\eta\alpha\omicron\varsigma$, of Avicen they are called *almismar*, *thymion*

or *thymon*, representing the knobby tops of the hearb thyme. Avicen seemeth also to have given it this name *tusium*, or (as another translation hath it) *tarseum*.¹⁶

The topic of skin diseases was in a state of confusion, but one can understand why Barrough wrote in the middle of this exercise in scholarship and untangling of words: 'little credit is to be attributed to words or names, unless the matter be thoroughly discovered', and, 'we must not follow the names so much among the Barbarian and Arabian writers but the genuine and sincere descriptions of the things themselves'.¹⁷ This Baconian sentiment was to be echoed later by writers like Thomas Sydenham, and it reflects the way in which scholarship ceased to aid medicine, authority being replaced by observation.

Arabic medicine in England suffered two blows, apart from the general indifference of a backwater in humanist terms: its rejection by what humanist medical writers there were, which paradoxically kept it alive if only as a strawman against which a scholar-physician could pit his knowledge of Greek medicine, and the coming of a new empirical approach and novel theories (mechanical and chemical) which replaced Galenic medicine and its Arabic interpreters.

The second stage was by no means clear-cut. William Harvey told John Aubrey to 'go to the fountain head and read Aristotle, Cicero and Avicen, and did call the neoteriques shitt-breeches'.¹⁸ Harvey's traditionalism is well known.¹⁹ He used Arabic authors (Avicenna and Averroes) in his *Anatomical Lectures* to illustrate a point: 'Whence also exceeding smallness is a disease of the liver whose outward size according to Avicenna is shortness of the fingers', or to set out a range of opinions as in the question of the number of lobes of the lungs.²⁰ Harvey had read Avicenna's *Canon*, probably in the Gerard of Cremona version, but his knowledge of Averroes may have been second-hand through references in works such as Bauhin's *Theatrum Anatomicum* (1605) and Du Laurens' *Historia Anatomica* (1599).²¹ In the *Lectures* the Arabs were seen just as any other body of knowledge to be deployed alongside the Greeks and the neoterics for teaching theory, illustrating a point, or for contradiction. They were fully part of the corpus of medical knowledge, even if not referred to all that frequently. This tone of acceptance is what one would expect of a pedagogical work. However, in *De Motu Cordis* and *De Generatione* there are hardly any references to Arabic medicine and nearly all of them are there in order to be contradicted. In anatomy and physiology the Arabs were not good starting points for research, for it was the Greeks, Aristotle and Galen, together with the sixteenth century anatomists who were seen by Harvey as worthy predecessors for the anatomist concerned with discovery. The Arabs were effectively by-passed.

More damaging, however, to the continued existence of Arab medicine in English medicine was Harvey's declaration in *De Motu Cordis* that he was not concerned with the scholarly enterprise of citing numerous authors, and that his business was with observing nature rather than with reading books. The empirical approach of Harvey and his successors was hostile to the continued integration of scholarship with medicine, and hence to the continued interest in Arabic medicine, just as Timothy Bright's localism expressed the disappearance of a universal body of medical knowledge in which Arabic medicine had its place. (The possible connections between the two processes should interest historians).

The total lack, as far as I can see, of any reference to Arabic writers in Thomas Sydenham's works stemmed from the approach to knowledge represented by Harvey and the new science, of the seventeenth century. Sydenham hardly mentioned any authorities and he combined his scepticism of them with a reliance on personal observation:

In writing the history of a disease, every philosophical hypothesis whatsoever that has previously occupied the mind of the author, should lie in abeyance. This being done the clear and natural phenomena of the disease should be noted - these, and these only.²²

Sydenham paid no attention to the history of his subject, apart from mentioning the preeminence of Hippocrates, he wrote generally only that 'others have been conspicuous for their industry; men who, by attending to anatomy, to pharmacy, to the *methodus medendi*, have done their best towards enlarging the boundaries of medicine. . . The praises of these I leave to better pens than my own.'²³ The victory of the moderns was in the air, and when Sydenham's attention was drawn to theory it was not to the shared humoral theory of the ancients and the Arabs but to the new mechanical and chemical philosophies, and to terms such as 'fermentation' and 'ebullition'.²⁴

With the coming of the new philosophies, Arabic medicine ceased to be of interest to 'elite', medical writers like Willis or Glisson. The former was generally sparing in his mention of previous authorities, whilst the latter, following the tradition of anatomical writers cited previous views in his *Anatomia Hepatis* (1654), but he jumped from the Greeks to the moderns with no mention of the Arabs.

In the more popular, downmarket, medical books influenced by the work of Paracelsus and Van Helmont there was a vestigial interest in the Arabs. They were associated with alchemy and astrological medicine. Early on, George Baker had given to the Arabs the honour of inventing the art of distillation. This was repeated by William Thraster in 1679, whilst Salmon, in 1707, had translated from Latin 'The Sum of Geber Arabs, and included it

in his *Medicina Practica*.²⁵ However, despite the Arabic connection with alchemy, Islamic physicians especially in the shape of Avicenna, were condemned along with Galen and his followers by those who tried to produce a new type of medicine based on chemical principles. Paracelsus had addressed his fellow physicians with:

Let me tell you this: every little hair on my neck knows more than you and all your scribes, and my shoe-buckles are more learned than your Galen and Avicenna, and my beard has more experience than all your high colleges.²⁶

And on the famous occasion of the bonfire of St. John's Day in Basle he had ceremoniously thrown Avicenna's *Canon* to the flames. Van Helmont also included Avicenna and the Arabs, in his rejection of traditional medicine:

I read the works of Galen twice, once Hippocrates (whose Aphorisms I almost learned by heart) and all Avicen, and as well the Greeks, Arabians as moderns, happily six hundred, I seriously, and attentively read through . . . At length, reading again my collected stuff, I knew my want and it grieved me of my pains bestowed, and years. When as indeed I observed, that all books with institutions, singing the same song, did promise nothing of soundness, nothing that might promise the knowledge of truth or the truth of knowledge.²⁷

The Arabs were thus caught up in the iatrochemists' condemnation of Galenic medicine. Noah Biggs, whose radical Puritan reforms for English medicine in the Protectorate have been described by Charles Webster, styled himself 'Chymiatrophilos' and wrote of the 'lovely face of chymistry'.²⁸ He hardly mentioned Arabic medicine in his vituperative condemnation of the Galenists ('Galen, their Prince, hath not shewn one medicine, that is not borrowed from empiricks'), except when condemning the whole business of traditional medicine: 'they read the voluminous books of Galen, Avicen and the interpreters'.²⁹ This extreme hostility to Galenic, and hence Arabic medicine, is another reason for the decline of Arabic medicine in England.

There were still some dying embers. Walter Harris in his *Pharmacologia Anti Empirica* (1683) took a more Galenic approach; and when writing of the nobility of past medical practioners he included the Arabs: 'Mesue was son (some say nephew) of Abdelas king of Damascus and Avicenna that great writer was an Arabian Prince'. He referred to the passage in the *Oriatrike* concerning Van Helmont's reading of Greek and Arabic authors:

But they all proved very unsavoury to his delicious or rather depraved palate: he concluded after all that there was no real knowledge but by inspiration and enthusiasm and fancied that he had no less than Raphael to inspire him.³⁰

Culpeper and Blagrove in their remedy books made the occasional mention of the Arabs. Culpeper in the *English Physitian Enlarged* (1655) conveyed a sense of distance when writing of the Arabs: 'Juleps were first invented, as

I suppose in Arabia, and my reason is, because the word Julep is an Arabick word'.³¹ Whilst Blagrove in his *Supplement to Richard Culpeper's English Physician* (1674), unlike Culpeper, did refer to particular Arabic authorities but without specific citation of their works:

Divers have been the opinions of authors about the temperature of camphire: some take it to be hot because it is of such tenuity of parts. Rhasis saith, it is cold and moist and Avicenna saith it is cold and dry, and that it causeth watchings and wakefulness and quieteth the senses of those that are hot.³²

Another spark can be found in Gideon Harvey's rambling diatribes against the medical profession. At one time he seemed to favour ancient medicine:

The ancient Greek and Arabian physicians, are now so much despised by the supposed accession and advancement of a new theory and Cortex-Steel practice, that in my opinion one certain part of Europe would in some tract of time want inhabitants were not a robust constitution and expectation the guaranty's of health!³³

This was typically countered with his description of the 'velvet flatcaps'—physicians—deciding to gather together all medical knowledge amongst which were 'great forgetful readings of Arabian authors', and 'materials extracted out of Mesues, Avenzoar, and what could be pick'd out of the rest of those Barbarian unpolished superstitious and incredibly ignorant Arabian (or rather mad rabious) imposters.'³⁴

There is little point in giving other bits and pieces to show that there was still some interest in Arabic medical writers. In general, what I have been describing is the victory of the moderns over the ancients, the triumph of the new science over the Aristotelian-Galenic medical world view of which Arabic medicine was a part.

The intensity of the fight meant that insight into the nature of Arabic medicine generally was lacking. There were certainly elements in Arabic medicine (as in Greek) which had analogies or even continuities with newer approaches. For instance, the Arabic descriptions of simple and compound drugs and their effects (with regional differences being emphasised) had similarities with the empirical attitude of the early Royal Society to the usefulness of remedies. Even more significant for the seventeenth century could have been the experimental alchemical approach which Jābir and Rhazes had integrated into medicine; for, while Arabic medicine was apparently in decline, it was being echoed, albeit on a popular level, by the Paracelsian or 'new' chemical medicine which ostensibly had rejected it.

The upsurge of Arabic studies in seventeenth-century England associated with Edward Pococke, John Selden, Edmund Castell, John and Thomas Greaves and Thomas Hyde did not include an interest specifically in Arabic

medicine, except for Pococke's translation of a treatise on coffee and Castell's Lecture on the merits of the study of Arabic as exemplified by the interpretation of the *Canon* of Avicenna (1667). In a sense, Arabic medicine, like Galenic medicine, was still too well known, still part of the life-blood of medical learning, and only when it was replaced by new approaches and theories, could Arabic medicine be studied historically.

POSTSCRIPT

Although lying strictly outside of our period John Freind's *History of Physick* (1726) written to Richard Mead and Mead's own work should be mentioned. Freind did view the Arabic writers from a more historical perspective, although we may disagree with his assessment of their writings: Arabic learning was wholly borrowed from the Greeks, their translations of the Greeks were 'not only loose and luxuriant, but far from being faithful'.³⁵ Freind moved from these gloomy generalisations to concede that 'something may be glean'd out of this set of writers ... not to be met with anywhere else'.³⁶ Freind also looked back at the career of Arabic medicine and summarised its rise and fall:

for many centuries they kept possession of the schools of Physick, and were magnified beyond all measure ... after the taking of Constantinople, a new turn soon followed, and these Arabians were as unreasonably decry'd. And since that time the fashion has been amongst a great many, to condemn and explode them in the gross, without examining their writings or comparing them with the Greek authors.³⁷

Freind could write as a historian, able to see overall patterns; but he was also a physician interested in the content of Arabic medicine. What he picked out were case histories, just as a modern doctor would find Hippocratic case histories easy to empathise with. Freind described, for instance, Rhasis 'speaking of his own experience, and he relates not a few particular cases, and some very remarkable, which he was concern'd in himself'.³⁸ Although Freind was not interested in humoral theory *per se*, he found not only the description of the disease but also the treatments used of interest in a practical medical sense. Arabic medicine still had a common link with eighteenth-century medicine in therapeutics and the practice of medicine.

Richard Mead was interested in Arabic medicine through his work on smallpox. He wrote that smallpox was not known to the Greeks, but had been described by Rhasis and he took the trouble to have Rhasis' treatise on the subject translated from Arabic (a copy of a manuscript was made for Mead through Boerhaave). The translations were made by 'Solomon Negri, a native

of Damascus, extremely well versed in all oriental tongues; the other John Gagnier, Arabic reader at Oxford'. As their two-versions differed and Mead knew no Arabic he got Thomas Hunt 'Arabic professor' at Oxford to collate the two Latin translations and compare them with the original Arabic.³⁹ What is significant is Mead's wish to have a translation direct from the Arabic, although he knew of three Latin translations of a Greek version of the treatise, but, as he explained, the Greek had not been translated directly from the Arabic but had come through a Syriac version. The translation was a product of the new expertise in Arabic in England. And as Freind also pointed out, the description of smallpox was original to the Arabs and clearly Rhasis' treatise held both historical and medical interest.

Mead and Freind took the Arabs seriously (Mead, for instance, described Arabian measures against plague). However, they were able to do so because they held radically different theoretical views from the Arabs. This allowed them to see the Arabic writers from a historical perspective, and the experience and interest that they shared with the Arabs in the stuff of medicine, patients and diseases, gave them the motivation to get involved in the study of Arabic medicine.

NOTES

¹ Sir Thomas Elyot, *The Castel of Health*, (my ed. London, 1561), p. a2.v. Cited in Andrew Wear, 'The Popularisation of Medicine in Early modern England' in *The Popularisation of Medicine 1650-1850*, ed. R. Porter (London, 1992), p. 21.

² See Nancy Siraisi, 'Renaissance Commentaries on Avicenna's *Canon*, Book 1, Part 1, and the Teaching of Medical *Theoria* in the Italian Universities', *History of the Universities*, IV (1984), pp. 47-97; and 'The Changing Fortunes of a Traditional Text: Goals and Strategies in Sixteenth-Century Latin Editions of the *Canon* of Avicenna' in *The Medical Renaissance of the Sixteenth Century*, ed. A. Wear, R. F. French, I. M. Lonie (Cambridge, 1985), pp. 16-41; see also N. Siraisi, *Avicenna in Renaissance Italy* (Princeton, 1987), published after this chapter was written; on humanistic medicine in general, see Richard Durling, 'Linacre and Medical Humanism' in *Linacre Studies: Essays on the Life and Work of Thomas Linacre, ca. 1460-1524*, ed., Francis Maddison, Margaret Pelling, and Charles Webster (Oxford, 1977), pp. 770-106; Vivian Nutton, 'John Caius and the Linacre Tradition, *Medical History*, XXXIII, 1979, pp. 373-89; Andrew Wear, 'Galen in the Renaissance', in *Galen: Problems and Prospects*, ed. Vivian Nutton (London, 1981) pp. 229-62; and the chapters by French, Lonie, Nutton and Wear in *The Medical Renaissance of the Sixteenth Century*.

³ Siraisi, 'The Changing Fortunes of a Traditional Text' (see note 2), p. 28.

⁴ Thomas Phayre, *The Book of Children* (London, 1591), pp. a2r.-a2v.

⁵ Andrew Boorde, *The Breviary of Health* (my ed. London, 1587), p. 5r.

⁶ For early popular medical books, see Paul Slack, 'Mirrors of Health and Treasures of Poor Men; the Uses of the Vernacular Medical Literature of Tudor England', in *Health, Medicine and Mortality in the Sixteenth Century*, ed. Charles Webster (Cambridge, 1979), pp. 238-273.

⁷ Timothy Bright, *A Treatise wherein is Declared the Suffiencie of English Medi-*

cines (my ed. London, 1615), p. 7.

⁸ *Ibid.*, p. 8; Robert Pitt, *The Antidote; or the Preservative of Health and Life, and the Restorative of Physick to its Sincerity and Perfection* (London, 1704), p. 45. In this and his other works Pitt condemned the complexity and expense of remedies. Clearly compound, expensive and exotic remedies were popular and M. B. Hall's paper (see above) attests to the interest in contemporary Arabic remedies. My paper is concerned with the interest in classical Arabic medicine.

⁹ *Ibid.*, pp. 8-9.

¹⁰ *Ibid.*, pp. 19-20

¹¹ *Ibid.*, p. 62. Cited in Wear, 'The Popularisation of Medicine', p. 27.

¹² *Ibid.*, pp. 62-3.

¹³ Thomas Phayre, *A Treatise of the Pestilence* (London, my ed., 1596), pp. 48 r-v. According to W.P.D. Wightman, *Science and the Renaissance* (Edinburgh, 1962), II, p. 195, Phayre follows closely the text of *Regime et traicte singulier contre la peste fait et composé par Maistre Nycollas de Houssemaine*.

¹⁴ Phayre, *Book of Children*, (London, my ed., 1596), p. 71r.

¹⁵ *Ibid.*, p. 77v, 85r.

¹⁶ Phillip Barrough, *The Method of Physick* (London, my ed., 1634), p. 258.

¹⁷ *Ibid.*, pp. 260, 261

¹⁸ Quoted by Geoffrey Keynes, Kt. *The Life of William Harvey* (Oxford, 1978), p. 434.

¹⁹ See especially Walter Pagel, *William Harvey's Biological Ideas* (Basel and New York, 1967).

²⁰ William Harvey, *The Anatomical Lectures of William Harvey*, ed. Gweneth Whitteridge, (Edinburgh and London, 1964), p. 137, p. 279.

²¹ See *Ibid.*, pp. 125, 285-7, 355.

²² *The Works of Thomas Sydenham M.D.*, ed. R. G. Latham, 2 vols, (London, 1848), Vol. I, p. 14.

²³ *Ibid.*, p. 10.

²⁴ *Ibid.*, p. 45.

²⁵ Conrad Gesner, *The New Jewell of Health published in Englishe by George Baker* (London, 1576), p. Bf; William Thraster, *The Marrow of Chymical Physick*, (London, 1679), p. 1; William Salmon, *Medica Practica* (London, 1707).

²⁶ Quoted from Allen Debus, *The English Paracelsians* (London, 1965), p. 16.

²⁷ John Baptiste Van Helmont, *Oriatrike or Physick Refined* (London, 1662), p. 13.

²⁸ Charles Webster, *The Great Instauration* (London, 1975), pp. 263-4 *et passim*, Noah Biggs, *Mataeotechnia Medicinae Praxews* (London, 1651), title page, p. 224.

²⁹ Biggs, *Mataeotechnia*, pp. 28, 29.

³⁰ Walter Harris, *Pharmacologia Anti-Empirica* (London, 1683), pp. a3.v.-a.4.v., 25.

³¹ Thomas Culpeper, *The English Physitian Enlarged* (London, my ed., 1676), p. 276.

³² Joseph Blaggrave, *Blaggrave's Supplement or Enlargement to Mr Nich. Culpeper's English Physitian* (London, 1674), p. 46.

³³ Gideon Harvey, *The Art of Curing Diseases by Expectation* (London, 1689), pp. 68-9.

³⁴ *Ibid.*, pp. 75, 76.

³⁵ J. Freind, *The History of Physick from the time of Galen to the Beginning of the Sixteenth Century*, 2 parts (London, 1726), part 2, p. 19-20, 24.

³⁶ *Ibid.*, p. 31.

³⁷ *Ibid.*, p. 33.

³⁸ *Ibid.*, p. 5.

³⁹ Richard Mead, *The Medical Works* (London, 1762), pp. 304-305.

WILLIAM NEWMAN

ARABO-LATIN FORGERIES:
THE CASE OF THE *SUMMA PERFECTIONIS*
(WITH THE TEXT OF JĀBIR IBN ḤAYYĀN'S *LIBER REGNI*)

Among the most famous scientific works ascribed to an Arabic author is the *Summa perfectionis* attributed traditionally to Jābir ibn Ḥayyān, or 'Geber,' as he was called in Latin. Five different editions of this text appeared between the 1480's and 1702,¹ in at least fifteen printings.² In England alone, the *Summa* received two printed vernacular translations during the second half of the seventeenth century, and one full-length Latin commentary.

Despite the early modern conviction that the *Summa* was written by an Arabic Geber, it has been suspected since the late nineteenth century that the text was a Latin forgery. The first scholar to state this emphatically was Marcelin Berthelot, whose *La chimie au moyen âge* of 1893 asserted that the real author of the *Summa* was probably a scholastic writer living sometime after the mid-thirteenth century.³ As I have recently been able to show, the *Summa's* real author was most likely a Franciscan monk named Paulus de Taranto, who wrote his *magnum opus* between 1270 and the first decade of the fourteenth century.⁴ In fact, Paul of Taranto was a thoroughly scholastic writer: both the *Summa* and another work ascribed to him, a *Theorica et practica*, are steeped in the method and vocabulary of the late medieval schoolmen. We must therefore wonder why, at a period when medieval learning had reached the ebb tide of its popularity, the 'chemical textbook of mediaeval Christendom,' to use Sarton's expression, still commanded such authority.⁵

In order to explain the *Summa's* continuing popularity, it will first be useful to look at the works of two seventeenth century British *adepti*, who both died around the time of the great plague of London. Then I will introduce the comments of the *Summa's* translators. Finally, it will be necessary to probe the sources of their comments, a task which will require our backtracking four centuries.

It is interesting to note that the authors most fascinated by the pseudonymous work of Paul of Taranto frequently adopted his very practice of employing a *nom de guerre*. Such is the case, for example, with Thomas

Vaughan, twin brother of the famous metaphysical poet, Henry Vaughan the Silurist. Thomas, who wrote under the pseudonym Eugenius Philalethes, is best known for his scurrilous pamphlet war waged against the Cambridge Platonist Henry More between 1650 and 1651.⁶ In addition to this invective literature, however, Vaughan wrote a *corpus* of eight alchemical pamphlets between 1650 and 1655, which has long commanded the interest of scholars. Following the lead of Trithemius of Sponheim and Agrippa of Nettesheim, Vaughan interprets the medieval authors in a Neoplatonic sense.⁷ The old alchemical recipes are riddles written in a figurative language meant to hide the real subject of the alchemical art. Vaughan believes that the metallurgical and chemical language of alchemy overlies a process involving the purification of common humus, in order to arrive at its hidden, elementary nature. This 'virgin earth, being associated with the tellurian dust from which God made man according to Genesis, would of course have miraculous powers. A faithful exegete of the alchemical tradition, he finds it necessary to make the torch-bearers of alchemy conform to his non-metallurgical interpretation. It is at this point that we encounter the *Summa perfectionis*. In his *Aula lucis* Vaughan writes a brief eulogy of Geber, in which he claims that the supposed Arabian was really more pious than most Christians:

Hee I say, hath so *freely*, and in truth so *plainly* discovered this *secret*, that had hee not *mixt* his many impertinencies with it, he had directly *prostituted* the *mysterie*...we are indeed more beholding to this *Prince*, who did not know *Christ*, then to many profest *Christians*...⁸

Even the uninformed reader will be struck by two facts— first that Vaughan has attributed many impertinencies to Geber, and second, that he has bestowed a royal title upon him. It is clear from Vaughan's other remarks that Geber's impertinencies refer to the numerous metallurgical and chemical processes described in the *Summa*, which in our Welsh alchemist's opinion can only lead to a *torture of Metals*.⁹ If one removes the chemistry and metallurgy from the *Summa*, however, very little is left. Why then does Vaughan continue to laud Geber? The answer lies in Vaughan's conviction that Geber was a powerful Arabian prince steeped in the mysteries of alchemy. Thomas Vaughan is unwilling to discard the image of an alchemical potentate from the land of legend, ruling by the limitless power of his art. That the *Summa's* metallurgical alchemy does not agree with his own Neoplatonic brand bothers Vaughan very little, since he can claim that Geber included these processes merely to delude the uninitiated.

Let us now turn from Eugenius Philalethes to his contemporary, Eirenaeus Philalethes. Despite the similarity of their pseudonyms, Eugenius and Eirenaeus were quite different people, espousing their own distinct views of

what alchemy should be about. Eirenaeus Philalethes is now generally considered to have been the pen-name of George Starkey, a native of Bermuda, educated at Harvard, who immigrated to London in 1650.¹⁰ Like Thomas Vaughan, he succumbed around the time of the London plague in 1665. Starkey is an interesting figure for numerous reasons. He was a member of Samuel Hartlib's scientific circle in the 1650's, and in that ambience met Robert Boyle, with whom he performed some experimentation.¹¹ As Eirenaeus Philalethes, Starkey seems to have also exercised an influence on Isaac Newton, who owned a heavily annotated copy of the Philalethan *Secrets Reveal'd* or *Introitus apertus ad occlusum regis palatium*, and who transcribed an alchemical *Clavis* derived from one of Starkey's letters to Robert Boyle.¹² The *Enarratio methodica trium gebri medicinarum* attributed to Eirenaeus Philalethes, is, as the title indicates, a commentary on the work of Geber.¹³ I am not at all convinced that the *Enarratio* was really written by the author of the *Introitus apertus*, however. The Latin of the *Enarratio* does not measure up to the ornate humanistic prose of the *Introitus*, and the *Enarratio* is missing in the list that Starkey *cum* Philalethes prepared of his own books in his *Ripley Reviv'd*, published posthumously in 1678.¹⁴ Nonetheless, the *Enarratio* is useful as an example of mid-seventeenth century English interest in Geber.¹⁵

Like the works of Thomas Vaughan, the *Enarratio methodica* does not focus on the metallurgical processes of Geber. This is not, however, due to a rejection of metallurgical alchemy in general, but simply the reflection of a theoretical bias. The *Enarratio* is less interested in laboratory work than in alchemical speculations about the nature of matter. It is here that the *Summa's* influence is most strongly felt. The *Enarratio* at numerous points claims that transmutation can only occur after a *mixtio per minima* of two reagents.¹⁶ This phrase, which can be translated as mixture through the smallest, occurs at numerous places in the *Summa perfectionis* as well, where it is clearly the expression of a naive corpuscular philosophy.¹⁷ The *Summa*, for example, explains the process of calcination, by which a metal is converted to its oxide upon heating, in corpuscular terms. Metals are primarily composed of very fine particles of mercury. Large earthy particles interrupt the continuity of mercury particles in a metal, however, making it possible for fire to enter between them. When the flame has burned out this earthiness, only the discontinuous mercury particles are left, in the form of a powdery calx. The *Enarratio methodica* recapitulates the *Summa's* explanation of calcination, and extends it to include the alchemical process of putrefaction. A substance is made to putrefy by the application of heat, which causes its substantial humidity to evaporate. When this interparticular glue has been eliminated,

one is left with discontinuous particles, which appear as powder.¹⁸ But what is the nature of the minimal parts themselves? Here the *Enarratio* proffers some interesting comments:

You will also note [the expression] 'through the smallest,' that is 'through indivisibles,' for if something can be divided, it would not be 'smallest,' since every part must be smaller than its whole. It therefore appears that 'through the smallest,' that is, '[through] indivisibles,' refers to the mixture of the elements. And that an element is the smallest of evident bodies appears through its definition, since an element is the smallest particle of a body.¹⁹

Hence the fundamental particles which make up material things are simply the four elements. The author of the *Enarratio* has pilfered these comments verbatim either from the sixteenth century *Ars et theoria transmutationis metallica* or the *Voarchadumia* of Ioannes Augustinus Pantheus, a Venetian priest who dedicated his work to Leo X.²⁰ It is likely that the inspiration for the *Enarratio's* theft lay in the obvious similarity between the corpuscular philosophy of Pantheus and the matter theory expressed by the *Summa*. Nonetheless, the *Summa* preserves a careful ambiguity in its relation of the elements to the corpuscles that is lacking in the *Ars et theoria*.²¹ The reason for this lies in the *Summa's* fundamentally Aristotelian character. In *De generatione et corruptione*, Aristotle explicitly rejected the notion of Empedocles that the four elements were like discrete bricks or stones which clump together to make up compounds.²² As Aristotle argues, such a scheme would deny the reality of the mixture which it tried to explain, since such particles could only form aggregates. True mixture—*krasis* or *mixis*—on the other hand, only results when a body is completely homogeneous—when every part is identical to every other part. The *Enarratio*, therefore, although using the *Summa* as the launching pad for its corpuscular philosophy, has proceeded well beyond the *Summa* in adopting the thesis of Pantheus that the four elements form distinct indivisible corpuscles. It is fascinating now to observe how Pantheus and his plagiarist turn this doctrine of elemental indivisibility back on the Stagyrte. At the end of *De generatione* Book I, Aristotle states that 'Mixture is the union of the altered miscibles.'²³ This statement agrees completely with Aristotle's attack on the Empedoclean notion of mixture, which was really the aggregation of part to part. Pantheus and the author of the *Enarratio*, however, directly before relating the theory of indivisible elementary particles, paraphrase Aristotle as follows—'According to the philosopher in the first book of *De generatione*, mixture is the union of altered miscibles *conjoined through the smallest [particles]*' (my emphasis).²⁴ The unwary reader would here find Aristotle to be a supporter of Empedocles, with his brick-like, intransmutable elements. The author of the

Enarratio, therefore, has presented us with a Geberian Aristotle, by fusing the elemental theory of Pantheus with that of the *Summa*. As a result, the corpuscular theory of the *Enarratio* has proceeded beyond that of the *Summa* by adding the un-Geberian notion of particulate indivisibility.

The *Enarratio methodica* attributed to Eirenaeus Philalethes primarily draws on the *Summa perfectionis* for its corpuscular theory of matter. As shown earlier, the works of Eugenius Philalethes, or Thomas Vaughan, mention Geber as an alchemical authority and royal scion, but disregard the physical theories of the *Summa*. Let us now examine the *Summa's* English translators from the last quarter of the seventeenth century. The first of these was Richard Russell, an iatrochemical physician of London, who first published his translation in 1678. It is noteworthy that Russell takes precisely the opposite viewpoint from Vaughan concerning the author of the *Summa*:

The *Eminency* and *Worth* of this *Author* need no *Apology*, his *Works* sufficiently commend *Him*, who in his *Writings*, as the present *Book* clearly shews, used no *Tautologies*, *Circumlocutions*, or fruitless *Ambages*; but (like a good *Master*, intending to inform, not to perplex the *Minds* of his *Disciples*) so succinctly speaks of all *Things*, as is rarely seen in any other *Author*.²⁵

Vaughan had seen nothing but obfuscation in the chemical and metallurgical processes of the *Summa*. Russell, to the contrary, views Geber as a pedagogical master, who has presented the reader with easily comprehended directions for his scientific development. Furthermore, it is precisely in the processes so despised by Vaughan that Russell sees the chief value of the *Summa*:

...herein [the reader] will find *Instructions* sufficient to inform his *Judgment*, in preparing *Medicines* truly *Chymical*. For this *Author* (herein excelling others) hath clearly and candidly, though briefly, taught the *Methods* of purifying all *Metals*, *Minerals*, *Salts*, *Allomes*, &...²⁶

The *Summa* is useful above all as a text-book for carrying out preparatory cleansings and purifications of pharmaceuticals. Russell sees little value in the *Summa's* doctrine concerning the transmutation of metals, although he, like Vaughan, plays elsewhere on Geber's exotic reputation as a 'Famous Arabian Prince'.²⁷

The *Summa* here appears as part of the *Medicina practica* by William Salmon, like Russell an iatrochemical physician. Salmon is also similar to Russell in that he believes Geber to have been 'an Arabian King'.²⁸ Although we might therefore expect Salmon to share Russell's interest in the *Summa's* pharmacological role, this is not in fact the case. Salmon is firmly convinced of the possibility of alchemical transmutation. As he says himself, no 'man endued with Rational Faculties,' aware of 'the Power of Nature,' could deny the reality of the 'Great and Philosophical Work'.²⁹

Salmon was aware of Russell's work, but did not approve of it. First of all, he attacks Russell's translation for being 'very mean, and in some places false.'³⁰ More importantly, however, Salmon has completely reorganized the *Summa* and cut out most of the material not directly related to alchemical practice. In addition, he has incorporated parallel passages from other *opuscula* attributed to Geber where he finds these to be clearer than the *Summa*. Salmon's justification for this cutting and pasting derives from the *Summa* itself. As the translator says:

These are a taste of the many scores if not hundreds of places, which in Geber himself are designedly interrupted; which means the magistry is hid, and the method of operating and understanding of the secret, so obscured, that without a great deal of study, searching, comparing of places, and laying the ending and beginning together, it would be almost impossible to apprehend what he really intends; for this reason it was, that we went on, not in an orderly and succinct Translation, but rather compendiously to common place him³¹

Salmon here depicts a devious and stingy Geber who hides more than he reveals by deliberately mixing up the order of his materials. Russell, on the other hand had praised Geber for his singular pedagogical skill and unusual candour. Which one of our translators had the right idea? A consultation of the *Summa* will reveal, surprisingly, that both were correct. In the final chapter of the *Summa*, the author asserts that he has 'not passed on [his] science in a continuity of discourse, but strewn it about in diverse chapters,' in order to delude the unwary.³² This and other such statements—no doubt interjected by the author to explain away the inevitable failure of transmutation—supply Salmon with his justification for reorganizing and supplementing the *Summa*. Yet anyone who compares the *Summa* to other alchemical works, especially those of the fifteenth century and later, cannot help but observe the superior clarity of our supposed Arabian prince. The *Summa* bears the unmistakable stamp of its author's scholastic training in its tidy organization according to the principles of attack and rebuttal. Russell was fully justified in saying that the *Summa* was a pedagogical *tour de force*, a statement that has been echoed in modern times by Sarton's judgment that the *Summa* was the 'chemical textbook' of the Latin Middle Ages.

Thus far we have inspected four different views of the *Summa perfectionis*, all coming from mid- to late-seventeenth century English authors. It is interesting that each of these four authors has his own peculiar reason for concerning himself with this medieval text, and that no two of them coincide. Vaughan approves of Geber's quasi-Christian piety, but can find nothing to commend in the *Summa's* metallurgical chemistry. Only by sacrificing the literal meaning of the text can he save Geber's reputation. The Philalethes of

the *Enarratio methodica*, on the other hand, is primarily interested in the *Summa's* speculations about the nature of matter. The first English translator of the *Summa*, Richard Russell, sees the work as a useful propaedeutic manual for the practice of iatrochemistry, but is unconcerned with either matter theory or alchemical transmutation. William Salmon, finally, who both translated and reworked the *Summa*, believes wholeheartedly in the transmutation of metals, but unlike Vaughan and Eirenaeus Philalethes, he hopes to realize this by intensively applying the exact processes described in the *Summa*. Since each of these four British authors comes to the *Summa* from his own quite distinct perspective, we are no nearer to answering the question we posed at the beginning of this paper—to what did the *Summa* owe its remarkable popularity in the seventeenth century?

THE ROYAL GEBER

In order to explain the *Summa's* early modern success, we must look beyond the text itself, to external facts concerning its supposed author's reputation. This is not to deny that the *Summa* is a remarkably clear and comprehensive work of alchemy, but since numerous alchemical treatises of the same period, such as the *Semita recta* of pseudo-Albertus Magnus,³³ or the *Breve breviarium* of pseudo-Roger Bacon,³⁴ approach the *Summa's* clarity and comprehensiveness, we must wonder why the *Summa* still excited great interest as late as the beginning of the Enlightenment, while those other works did not.

Many of the mineralogical processes described in the *Summa* were in fact inadequate or even obsolete by the standards of the seventeenth century. In the realm of assaying, for example, the *Summa* says nothing of parting silver and gold by means of nitric and hydrochloric acid, reagents that were common in the West since the fourteenth century. Instead, it lists a battery of tests that could have easily been obviated by the use of the mineral acids. Similarly, the *Summa* treats iron as infusible, reflecting the author's knowledge of medieval furnaces with their relatively low maximum temperatures, but not applicable to the metallurgy of the scientific revolution. Many other examples of the *Summa's* antiquated technology could be drawn forth merely by comparing that work to the great metallurgical handbooks of the sixteenth century, such as Georgius Agricola's *De re metallica* (1556) or the *De la pirotechnia* of Vanoccio Biringuccio (1540). Despite Richard Russell's claim that the *Summa* contained a multitude of useful metallurgical processes, the informed reader of the seventeenth century would have done much better to turn to Agricola or Biringuccio. It would seem evident, then, that the *Summa's* appeal in the age of Boyle and Newton cannot have resided in its technological

sophistication.

Let us therefore examine our four British authors' statements about the *person* of Geber. Thomas Vaughan, as we noted, referred to Geber as a pious Muslim 'Prince.' Richard Russell's translation of the *Summa*, on the other hand, refers to its author as a 'Famous Arabian Prince,' while William Salmon calls him 'an Arabian King.' Only Eirenaeus Philalethes fails to mention the royal pedigree of Geber, but this omission is not surprising, given that Eirenaeus says nothing at all about Geber's person.

We are now in a position to ask several questions. First, where did the story originate that Geber was a king? Second, did this royal appellation affect the reception of the *Summa perfectionis*? As already mentioned at the beginning of this paper, the Latin *Summa perfectionis* attributed to Geber was a forgery probably written by a thirteenth-century Franciscan monk. Thanks to the gargantuan labors of Paul Kraus, however, a considerable amount is now known about Geber's namesake, the Islamic alchemist Jābir ibn Ḥayyān, who supposedly lived in the eighth century.³⁵ Kraus was able to prove at length that this Jābir was really the trademark, so to speak, of a group of Ismā'īlī propagandists writing in the ninth and tenth centuries. The Arabic Jābir frequently calls the *imam* Ja'far al-Ṣādiq his master, and occasionally Jābir himself is referred to as *imam*.³⁶ I have found no evidence, however, that the Arabic bio-bibliography associated with Jābir even refers to him as a secular ruler.³⁷ In order to determine the origin of Jābir's royal title, we must therefore turn to the medieval Latin sources. The earliest reference to the *Summa perfectionis* of sure date appears to be found in the *Conciliator* of Peter of Abano, written in the first decade of the fourteenth century.³⁸ Peter quotes several passages from the *Summa*, which he attributes to 'Ieber,' without further clarification. Some twenty years after the composition of Peter's *Conciliator*, however, a Carthusian monk named Ademar recorded a dialogue between himself and his brother William, in which he too referred to Geber.³⁹ Unlike Peter of Abano, Ademar had additional biographical information about Geber:

[You should read] Geber, because he is the most apposite proclaimer of the truth. His illustrious birth was the product of great Muhammad's daughter and a Baghdadian prince, as he himself writes in his book called *Liber regni*. For he is of such a reputation in Egypt that great Aristotle yields to him in triple philosophy, in the clever exposition of law Rabbi Moses yields to him, in the Koran Muhammad, in magical arts Hermes Trismegistus, in greater astronomy Ptolemy, in medicine Hippocrates and Galen, [and] in the quadrivium Euclid. In short, all the philosophers in [their] subordinated science are, when compared to him, so much worthless sand.⁴⁰

Ademar here portrays Geber as a sort of universal wise-man, outdoing all

the masters at their own respective games. Part of this praise derives, no doubt, from a confusion between Jābir ibn Ḥayyān and the twelfth-century astronomer and mathematician Jābir ibn Aflāḥ of Seville.⁴¹ Perhaps Ademarūs threw in natural philosophy, medicine, Qurʾānic exposition, law, and magic as a sort of icing to his cake, after determining that Geber was a past-master of alchemy and mathematical astronomy. This, however, does not explain the peculiar reference to Geber's royal descent from a putative daughter of Muhammad and a Baghdadian prince. Here Ademarūs refers us to statements ostensibly made by Geber himself in a *Liber regni*.

In the standard repertoires of Arabic scientific literature, such as Fuat Sezgin's *Geschichte des Arabischen Schrifttums*,⁴² Manfred Ullman's *Die Natur- und Geheimwissenschaften im Islam*,⁴³ or for that matter Kraus's *Jābir ibn Ḥayyān*,⁴⁴ there are several references to Arabic works attributed to Jābir that were translated into Latin. The most famous of these is the *Liber septuaginta*, Gerard of Cremona's translation of the Jābirian *Kitāb al-Sabʿin*. Additional translations include the *Liber misericordie*, a Latinization of Jābir's *Kitāb al-Rahma*, and the *Liber triginta verborum*, a part of the *Kitāb al-Sabʿin* that circulated separately in Latin. Nowhere in these sources, however, do we find a *Liber regni* attributed to Jābir.

Nevertheless, such references do exist. Moritz Steinschneider's *Europaeischen Uebersetzungen*, for example, makes a passing reference to a *Liber regni* by Jābir, contained in a well-known *codex* of the Palermo Biblioteca Comunale.⁴⁵ Julius Ruska, upon examining this *codex*, subsequently identified the *Liber regni* with Jābir's *Kitāb al-mulk*, or *Book of the Kingdom*.⁴⁶ Ruska made this conjectural identification in a three line note, however, apparently basing himself on the similarity of the Latin and Arabic titles alone. I have had the good fortune to obtain microfilms of several different manuscripts bearing the *liber regni*, which I have compared with the Arabic *Kitāb al-mulk* printed in Marcelin Berthelot's *La chimie au moyen âge*.⁴⁷ The Latin text, appended to this paper along with an English translation, is in fact a series of intermittent extracts haphazardly drawn from the *Kitāb al-mulk* of Jābir. Whether these extracts were translated as such, or represent the abridgement of a Latin exemplar, remains to be determined. A consultation of this mutilated *Liber regni* will at any rate help solve the mystery of Geber's royal title.

We shall, however, be sorely disappointed if we seek in the extant *Liber regni* for Ademarūs's exotic story of Muhammad's daughter and the Baghdadian prince. In fact our *Liber regni* gives no lineage whatsoever for the illustrious Jābir, nor does the Arabic version printed by Berthelot. Why then have I raised the hope of solving the origin of Geber's royal title? If we consult the rubric of the text, the following lines appear:

Here begin the excerpts of the book of Geber which he made for his son, and it is called the *Liber regni*, for it promises a kingdom.⁴⁸

So far so good. The title upon which Ruska based his identification with the *Kitāb al-mulk* appears without equivocation. The colophon of the text, however, presents a quite different story. It runs as follows:

Here ends the *Liber regis Geber*, which he abbreviated for his only son.⁴⁹

Liber regni has here been altered to *Liber regis*. But since *Liber regis* is followed immediately by 'Geber,' one could freely translate it either as *Geber's Book of the King*, or as *The Book of King Geber*. I submit that a man like Ademar, predisposed to credit his hero with the mastery of all wisdom, would have opted for the second choice. This of course will raise the question whether Ademar's story of Muhammad's daughter and the Baghdadian prince is mere fantasy on his part. The evidence would certainly point in that direction, since neither Berthelot's edition of the *Kitāb al-mulk* nor the mutilated *Liber regni* contain such a fable. Nonetheless, Berthelot's text is incomplete, and there may have been a longer Latin version from which the *Liber regni* was extracted. It is therefore too early to dismiss Ademar as a fabricator of dreams.

Having discovered the apparent origin of Geber's royal title, we may answer the second question posed above, namely whether this honorific affected the *Summa's* transmission. I believe that Ademar's glowing description of the royal Geber, along with the three British references to his title, point to an unequivocal 'yes'. Nonetheless, factors clearly affected the *Summa's* reception as well. The choice of 'Geber' as pseudonym allowed the *Summa* to be identified with the works of that consummate astronomer Jābir ibn Aflah, who thus became a sort of universal sage. Another factor lies in the *Summa's* conscious mimicry of *formulae* and stylistic peculiarities found in the Latin *Liber septuaginta*. These *formulae*, such as 'scias hoc, quia est magnum secretum,' and 'benedictus igitur sit gloriosus et sublimis deus,' not to mention longer passages, gave the *Summa* an oracular quality which clearly appealed to its medieval and early modern audience alike.⁵⁰

All of these factors were perhaps necessary, but not sufficient conditions for the *Summa's* remarkable success. Without the unusual clarity of the text, its tight organizational structure, and the originality of its theories, the *Summa* would probably not have become the 'bible' of the medieval alchemists. When Paul of Taranto chose to 'package' these laudable characteristics under the 'brand-name' of Geber, however, he was acting in the best tradition of publicity. Although we cannot be sure that Paul knew the *Liber regni* or intended his Geber to be confused with Jābir ibn Aflah, the oriental mystery

in which his borrowed *formulae* shrouded the *Summa* insured that his work would catch the imagination of his audience. In this Paul surpassed even his Ismā 'ilī forebears, whose product he both transformed and passed on.

APPENDIX

The following pages contain our working edition of Jābir's *Liber regni*, accompanied by an English translation. The Latin text has been prepared with the aid of five manuscripts, whose sigla we shall list below:

- F *Base manuscript.* Firenze, Biblioteca nazionale centrale, II.I,364, ff. 27rb-vb.
 C Cambridge University, Trinity College 1400, ff. 24r-v.
 P Palermo Biblioteca Comunale 4QqA10, f. 378r-v (397r--v).
 R₁ Firenze, Biblioteca Riccardiana 119, f. 50r.
 R₂ Firenze, Biblioteca Riccardiana 119, f. 96v.

F and P are fourteenth century manuscripts, while C, R₁, and R₂, appear to belong to the fifteenth century. The two texts from the Riccardiana manuscript are written in the same hand, and often agree where the other versions deviate in their readings. It is therefore possible that the scribe (or the copyist of his exemplar) may have simply made the accident of copying the same manuscript twice. Nonetheless, I have thought it more satisfactory to include the variants of both R₁ and R₂ than to ignore the readings of one or the other.

L. Thorndike and P. Kibre (*A Catalogue of Incipits...* (Cambridge: 1963), col. 646.5) mention another MS, Napoli, Biblioteca Nazionale XII, E.15, 23r-4r. I have not been able to consult this manuscript.

27rb] Incipiunt excepta libri Yeber quem fecit ad filium et dicitur
 Liber regni quia regnum spondet. Et hunc librum separavimus
 ab aliis libris ut puta utiliore aliis quia hic est medulla
 operis et opus abbreviatum. In viginti diebus duos lapides exigit hoc

1. *ante* Incipiunt *add.* Incipit liber regni ieberri P Excepta libri Geber R₁
 Incipiunt excepta libri Geber R₂//Incipiunt —spondet: Incipit liber Regis qui
 liber de 70^a et Septuagesimus dicitur C//Yeber: geber R₁R₂//2. Liber: hic liber
 liber PR₁R₂//Et *om.* CPR₁R₂// 3. utiliore: et utiliore F//4. operis *om.* R₂//5.

- 5 opus.//Et non est hoc opus distillatione, solutione, et congelatione.//
Et scias quod aqua, oleum, et ignis, quando miscentur, miscentur
mistura completa, donec totum sit rubeum et per se ipsum congelatur,
et sit totum sicut sunt grana de perlis tanquam rubeis.//Et nos
nominavimus lapides qui sunt prope et qui longe in *Libro de septuaginta*
10 et in aliis libris, sed quod hic dicam non dixi in aliquo librorum
meorum.//Et nominavi in libro pondus, sed non nominavi sic
quod ideo aliquis posset lapidem scire.//Scire debes filii quod
maiora pondera sunt tria.//Et pondera plana sunt duo—aqua et
ignis—et hic ostendam qualiter fiat opus in istis; et ibi terminatur
15 liber.//Et nota quod pondus aque non est multum necessarium, et
tamen est mirum quod super id fit fabrica operis.//Et cum
legeris librum istum [27va] et alios meos libros, cognosces
quod verum dico, et quantum do tibi in hoc opere.//Et
scias quod ideo fuit appellatum pondus aque quia manifestius
20 ostendit maioritatem et minoritatem ponderum quam alia
pondera. Propter hanc rationem magis est necessarium pondus
aque ponderi ignis quam pondus ignis ponderi aque.//Et potest
esse quod pondus ignis exeat in hoc opere magis completum
quam posset esse. Et non est verisimile quod opus
25 faciat per se ipsum.//Et quando coniunguntur pondus ignis et
pondus aque, potest esse quod exibat quod querimus nisi
sit propter errorem magisterii.//Et videntur hec contraria
illis que diximus in *Libris ponderum*. Et fit opus in
spatio ictus oculi.//Et est efficacia huius operis in

et congelatione: congelatione FP//6. oleum: et oleum P//quando: non R₁R₂//
alt. miscentur: miscentur P om. R₁R₂//7. totum: tota R₁R₂//rubeum: rubeam F
//et om. P//congelatur: congelatum C//8. sit: fit C//rubeis: rubeus F//9.
nominavimus: nominamus FCR₁R₂//longe: sunt longe rell.//11. Et om. P//12.
aliquis: aliud ut vid. R₁//posset: possit rell.//14. terminatur: terminabitur C//
15. aque om. F//16. quod: quia PP//id: illud CR₁ illum P//operis: operum ut vid.
R₂//17. libros om. P//19. aque: aqua R₁R₂//manifestius: manifestus ut vid. F
//21. post pondera add. ignis F//24. posset: possit CR₁//Et: et tamen rell.//quod
opus: per opus quod CR₁R₂ quod opus quod P//27. hec: que R₂//29. huius

- 30 purgando lapidem a suis unguentis, et aliis que prohibent eius
 efficaciam et virtutem propter illas infirmitates quas habet
 lapis. Sunt necessaria illa longa tempora que de ipsis dicuntur. //
- Quia si lapis esset purgatus et mundus, per se tingeret et
 faceret opera sua, notandum est ergo quod debemus molere lapidem
- 35 cum argento vivo, quod et de ipso lapide est. Et tunc completur
 cum eo mistura debili<s>, postmodum cum aqua. Et per fidem
 quam debeo magistro meo Iafac Ascandet, aqua et unguentum
 super aquam. Unguentum - hoc est quod nominavimus in *Libro de*
septuaginta mendicum maris, et diximus qualiter caperetur
- 40 ille mendicus.//Quando igitur vides oleum super aquam
 ita album et pulcrum ut visum, videatur auferre. Tunc illud
 congrega, et quod coniungitur - sive parum sive multum - illud
 perficiet opus quod volueris, et congelatur per se, et fiet rubeum
 vel nigrum ad colorem piperis, scilicet rubeum obscurum. Si sit
- 45 rubeum extra, scias quod est album intus. Et cum tale
 erit, proicias unum super mille milia, et super ducenta milia
 ut dictum est. Et non est hoc verbum coopertum, sed per deum,
 ita est ut dictum est. Et hoc opus fit ad plus in septuaginta
 annis ut dixi in aliis libris, set potest fieri in viginti diebus, et
- 50 in ictu oculi, nisi esset propter illa que adiunguntur et propter
 preparata. Et nullus sapiens invenit unquam [27vb] tam brevem viam
 et tempus ad hoc opus sicut ego dicam. Sed doceo viginti dies. Sed
 quidam dixerunt in suis elixeriis vias que hic
 dicuntur in nostro lapide, non quod in veritate in illis essent

operis *om.* R₁R₂//30. aliis: alia P//33. Quia— sua *om.* R₂//purgatus: purgatum
 F//34. notandum: non *ut vid.* F//35. *pr.* et *om.* PR₁R₂//lapide *om.* C//36.
 postmodum: post mole P//37. Iafac Ascandet: iaffas ascendet C iafas ascendit
 P iafas ascendet R₁R₂//Unguentum *om.* C//hoc: et hoc PR₂//nominavimus:
 nominamus FPR₁R₂//de *om.* P//39. mendicum: indicum P//caperetur: raperetur
 C//40. vides: videmus F//oleum—videatur au—*om.* C//42. *alt.* sive: sive et P
 //illud *om. rell.*//43. perficiet: faciet CR₁R₂ facies P//43. volueris: voluerunt P
 //rubeum: album R₂//46. proicias: proicies P//47. sed: sed sic C sed sicut dico
 PR₁R₂//48. ut dictum est *om.* CPR₁R₂//hoc: hec F//49. in aliis libris *om.* F//50.
 illa: illam R₁R₂//51. preparata: preparatam R₁R₂//52. dies: dierum CR₁R₂//
 Sed: *om.* C sed tamen R₁//53. Quidam: quidem tamen C dum quidam P tamen
 quidam R₂//elixeriis: elisir F//que: quas CP//54. dicuntur: dicunt P//55. quod

- 55 tante vires. Et nominaverunt illos lapides tali nomine quod
 similiter istis que diximus hic. Et vocaverunt fulgur
 erradicans et niveam pupillam oculi, et qui arranzat et
 est arranzatus - idest qui vincit et vincitur.//Et certe ex
 hiis que dico potes et debes elicere magnam utilitatem
 60 et veritatem. Et multi casualiter venerunt ad hunc
 effectum, et postea venire non potuerunt, quia casus fuit et non ars.//
 Explicit *Liber regis Yeber* quem
 abbreviavit ad filium suum solum.

om. C//56. similiter: simile C simile erat PR₂ simile erit R₁//fulgur: sulfur R₂
 //57. erradicans: radians C//niveam *non leg.* CR₁R₂ vivam P//ante pupillam
add. et R₁ idest R₂//qui: quidem C//arranzat: artanzat F aranzant C aranzat
 Paranzat R₁ arranzat R₂//58. arranzatus: attanzatus F aranzannis C arranzarus
 P arranzatus R₂//idest *om.* CR₂//qui: et quod R₂//alt. Et *om. rell.*//60. venerunt:
 pervenerunt P//61. postea: post FC//62-3. Explicit - solum: Et finitur liber
 regis C Expliciunt excepta libri jeber sive liber regni jeber amen P etc. R₁ Et
 hic est finis huius libri R₂//

THE BOOK OF THE KINGDOM

Here begin the excerpts of the book of Geber which he made for his son, and it is called the *Book of the Kingdom*, for it promises a kingdom. We have selected this book from [our] other books as more useful than the others, because this is the marrow of the work and the abbreviated work. This work requires two stones in twenty days.//And this work is not effected by distillation, solution, and congealment.//Know that water, oil, and fire, when they are mixed, are mixed with a complete mixture until the whole becomes red and is congealed by itself. And then the whole should be just like red pearls.//We have named the stones which are proximal and which are distal in the *Seventy Books* and in other books, but I have not said what I will say here in any of my books.⁵¹//I have named the weight in a book, but I have not named it in such a way that anyone could find the stone.⁵²//You must know, sons, that the greater weights are three.//And the plain weights are two—water and fire—and here I shall show how the work is performed in the latter:

the book is here terminated.//Note that the weight of water is not very necessary, and yet it is marvellous that the entirety of the work rests upon it./ /And when you read this book and my other books, know that I speak truly, and [know] how much I give you in this work.//Know also that the weight of water was mentioned because it shows the majority and minority of weights more openly than the other weights. For this reason the weight of water is more necessary to the weight of fire than the weight of fire to the weight of water.//And it can happen that the weight of fire go forth as complete as can be in this work. It is not true that the work can do this by itself alone.//When the weight of fire and the weight of water are conjoined, it can happen that what we seek will be produced, unless an error in our magistry occur.//And these things seem contrary to those which we said in the *Books of Weights*.⁵³ And the work is brought about in the wink of an eye. //The efficacy of this work exists in purging the stone from its oils and from others which reduce its efficacy and power, due to those infirmities which the stone has. Those long times which are said of them are necessary.//Since, if the stone were purged and clean, it would tint and perform these works by itself,⁵⁴ it must therefore be noted that we should grind the stone with quicksilver, which is also from the stone itself. And then a weak mixture is completed with that, and afterwards with water. And by the faith that I have in my master Iafac Ascandet,⁵⁵ water and oil upon the water. . . . Oil—that is what we have called *mendicus* of the sea in the *Seventy Books*, and we have there said how this *mendicus* should be captured.⁵⁶//Therefore when you see oil upon the water as white and lovely as [can be] seen, remove it.⁵⁷ Then collect this, and when it is brought together—be it much or little—it will perfect the work which you seek, and it is congealed by itself, and will become red or black in the color of pepper, namely a dark red. If it be red on the outside, know that it is internally white.⁵⁸ When it has become thus, project one upon a thousand thousand, and upon two hundred thousand, as was said. This is not a hidden discourse, but by God, it is just as has been said. And this work occurs in seventy years at the most, as I have said in other books, but can be performed in twenty days, and in the wink of an eye, unless it be [impeded] on account of those which are added together and on account of the prepared. And no wise man ever finds so brief a way and time to this work [on his own] as I have said. But I teach twenty days. Yet some have described the ways which here are said about our stone in their elixirs, but in truth there were not as many powers in them. And they have called these stones by such a name as is similar to those which we have said here. And they have called it ‘destroying lightning’ and ‘snowy pupil of the eye,’ and ‘that which *arranizat* and is *arranizatus*’⁵⁹—that is, ‘which conquers and is conquered.’//And

certainly from these things that I say, you can and must elicit great utility and truth. And many have arrived by chance at this effect, and then could not arrive again, since it was chance and not art.//Here ends the *Book of King Geber*, which he abbreviated for his only son.

NOTES

¹ The five editions of the *Summa perfectionis* are as follows:

1. *Liber Geber*. [Rome: Eucharius Silber, c. 1485-90].
2. *Geberis...Summa perfectionis magisterii in sua natura*. (Rome: Marcellus Silber [c. 1525]).
3. Chrysogonus Polydorus, ed. *In hoc volumine de alchemia continentur...* (Nuremberg: Iohannes Petreius, 1541).
4. *Gebri Arabis...De alchemia traditio summae perfectionis...*(Strasbourg: Lazarus Zetzner, 1598).
5. Georg Horn, ed. *Gebri arabis chimia; sive Traditio summae perfectionis....* (Leiden: A.Douden, 1668).

With the exception of No. 5, all of the above editions are based on different manuscripts. Horn's 'edition' is in reality a whimsical reworking of the 1598 version (No. 4).

² The reprints are listed according to the numbers given in n. 1 above:

1. Reprinted in Strasbourg by Johannes Greiningen, 1528, 1529, 1531, with very slight changes, as *Geberi philosophi...De alchimia libri tres*. Cf. John Ferguson, *Bibliotheca Chemica...* (Glasgow: 1906), I, p. 302.
2. Reprinted in Venice, in 1542, by Petrus Schoeffer; reprinted again in Danzig, in 1682, by Bruno Tancken; reprinted again in J. J. Manget, *Bibliotheca chemica curiosa* (Geneva: Chouet *et al.*, 1702), I, pp. 519-557.
3. Reprinted in Chrysogonus Polydorus, ed. *Alchemiae Gebri Arabis....* (Bern: Mathias Apiarius, 1545). Reprinted again in Guglielmus Gratarolus, ed. *Verae alchemiae...doctrina*. Basel: Henricus Petri and Petrus Perna, 1561. Reprinted again in *Artis chemicae principes....* (Basel: Petrus Perna, 1572).
4. As we stated in n. 1, Horn's 'edition' is itself a re-working of the version published by Lazarus/Zetzner in 1598. Ferguson, *op. cit.*, 302, seems to imply that Zetzner's edition was reprinted in 1649, in a smaller format.
5. Reprinted in *Ginaeceum chemicum....* (Lyons: Iohannis de Trevis, 1679), pp. 1-163.

Ferguson, *op. cit.*, 302, mentions other possible printings, but these appear to be based on secondary references rather than first-hand inspection.

³ Marcelin Berthelot, *La chimie au moyen âge* (Paris: 1893), I, pp. 336-50.

⁴ William Newman, 'New Light on the Identity of Geber,' *Sudhoffs Archiv*, LXIX, 1 (1985), pp. 76-90. Also, Newman, 'The Genesis of the *Summa perfectionis*,' *Les archives internationales d'histoire des sciences*, n. 114/115, Vol. 35 (1985), pp. 240-302.

⁵ George Sarton, *Introduction to the History of Science* (Baltimore: 1931), II, p. 1043.

⁶ Newman, 'Thomas Vaughan as an Interpreter of Agrippa von Nettesheim,' *Ambix*, XXIX, 3 (Nov., 1982), pp. 125-40.

⁷ *Ibid.*

⁸ Thomas Vaughan, *Aula Lucis or The House of Light: A Discourse written in the year 1651. By S. N. a Modern Speculator* (London: 1652), pp. 21-2.

⁹ Vaughan, *Euphrates, or the Waters of the East: Being a Short Discourse of that*

Secret Fountain, whose Water flows from Fire; and carries in it the Beams of the Sun and Moon, (London: 1655), A3v.

¹⁰ Harold Jantz, 'America's First Cosmopolitan,' *Proceedings of the Massachusetts Historical Society*, LXXXIV (1972), pp. 1-25. Ronald Sterne Wilkinson has written a number of articles on the Starkey - Philalethes problem; for our purposes the most pertinent are 'George Starkey, Physician and Alchemist,' *Ambix*, XI (1963), pp. 121-52; and 'Some Bibliographical Puzzles Concerning George Starkey,' *Ambix*, XX (1973), pp. 235-44.

¹¹ Wilkinson, *Ambix* (1963), pp. 128-31.

¹² Betty Jo Teeter Dobbs, *The Foundations of Newton's Alchemy* (Cambridge: 1975), pp. 10; 88, n. 153; 175-86. Newman, 'Newton's Clavis as Starkey's Key,' *Isis*, 78 (1987), pp. 564-574.

¹³ Eirenaeus Philalethes, *Enarratio methodica trium gebri medicinarum...* (London: 1678).

¹⁴ Wilkinson, *Ambix* (1973), p. 240.

¹⁵ The English origin of the *Enarratio* is assured by its author's reference to the fifteenth century Bristol alchemist Thomas Norton as 'Nortonus nostras,' on p. 90. For more on Norton, see the excellent edition and study in John Reidy, *Thomas Norton's Ordinal of Alchemy* (Oxford: 1975).

¹⁶ Philalethes, *op. cit.*, pp. 6; 70; 142; *et sparsim*.

¹⁷ William Newman, *The Summa perfectionis of pseudo-Geber* (Leiden, 1991), pp. 143-192.

¹⁸ Philalethes, *op. cit.*, pp. 28-9.

¹⁹ *Ibid.*, p. 70: Notabis etiam per minima, id est, per indivisibilia, nam si quid possit dividi non esset minimum, cum omnis pars minor sit suo toto. Apparet ergo quod per minima, id est, indivisibilia fit mixtio Elementorum. Et quod Elementum sit minimum corporum apparentium patet per definitionem ejus. Elementum enim minima Corporis particula est.'

²⁰ Ioannes Augustinus Pantheus, *Ars et theoria transmutationis metallica cum voarchadumia*, in Lazarus Zetzner, *Theatrum chemicum* (Strassbourg, 1659) II, pp. 464-465. Pantheus, *Voarchadumia contra alchemiam*, in Zetzner, *TC* II, p. 524. The same passage appears in both works. Subsequent passages in the *Enarratio* make it seem that the author is using the *Voarchadumia* rather than the *Ars et theoria*, but one cannot draw any certain conclusion without consulting the various editions of the two works. Thorndike (*HMS* V, p. 539), notes that the first edition of the *Ars et theoria* appeared in 1518.

²¹ Newman, *The Summa* (1991), pp. 143-92.

²² Aristotle, *De generatione et corruptione*, 334a16 - 334b7.

²³ Aristotle, *Aristotelis opera cum Averrois commentariis* (Venice: 1562) Volume V, Book I, f. 370b.

²⁴ Philalethes, *op. cit.*, p. 69: 'Secundum philosophum (primo de Generatione) mixtio est miscibilium alteratorum per minima Conjunctorum unio.'

²⁵ Richard Russell, *The Works of Geber* (London: 1686), A2r. Cf. Ferguson, *op. cit.*, p. 302, for the first printing.

²⁶ *Ibid.*, A3r.

²⁷ *Ibid.*, title page.

²⁸ William Salmon, *Medicina practica or Practical Physick...* (London: 1692), H3r.

²⁹ *Ibid.*, B2v.

³⁰ *Ibid.*, Bv.

³¹ *Ibid.*, B2v.

³² Newman, *The Summa* (1991), p. 630: '...non tradidimus scientiam nostram sermonis continuatione, sed eam sparsimus in diversis capitulis.'

³³ pseudo-Albertus Magnus, *Libellus de alchimia (= Semita recta)*, in B. Alberti

magni...opera omnia, ed. Auguste Borgnet (Paris: 1898), XXXVII, pp. 545-573.

³⁴ pseudo-Roger Bacon, *Breve breviarium*, in *Sanioris medicinae...* (Frankfurt: 1603), pp. 95-264.

³⁵ Paul Kraus, *Jābir ibn Ḥayyān: Contribution à l'histoire des idées scientifiques dans l'Islam* (Cairo: 1943), I, pp. XVII-LXV.

³⁶ *Ibid.*, p. XLII.

³⁷ The colophon *Opus maximi philosophi ac regis Indiae Geberi* does occur in the *Flos naturarum*, whose incunabulum is described by Ernst Darmstaedter (*Archiv für Geschichte der Medizin*, XVI, 3-6 (1925), pp. 214-7). David Pingree, however, who has recently done extensive work on the *Flos*, has assured me in correspondence that a) the unique MS of the *Flos*, Montpellier 277 (c. 1300), contains no such regal attribution, and b) that it is probable that the *Flos* was not translated from Arabic at all.

³⁸ Newman, 1985, p. 77.

³⁹ Lynn Thorndike, *A History of Magic and Experimental Science* (New York: 1934), III, pp. 135-6.

⁴⁰ Ademar extract from Paris Bibliothèque nationale lat. 14005, f. 91v:

...Gebri eo quod veritatis pronunciator aprior existit. Hic enim ex filia magni Machometi et ex principe Baldachitarum originem clarissimam traxit, ut ipsemet in libro suo qui dicitur *Regni* scribit. Est enim tante reputacionis in Egipto quod ei in triplici philosophia cedit magnus Aristotelis. In suavi legis expositione cedit ei Rabi Moises, Machometus in alchorano, Hermes Termegistus cedit ei in magicis artibus, Ptolomeus maiore in astronomia, Ypocrates et Gallienus in medicina, in quadrvio Euclides. Quid plura? In subjecta scientia omnes philosophi in respectu eius arena sunt exigua.

The odd expression 'Baldachitarum' may be explained as a variant of 'baldekinus,' from the Arabic "Baghdadi." Cf. R. E. Latham, *Dictionary of Medieval Latin from British Sources* (London: 1975), Fas. I, p. 177.

⁴¹ Newman, *Sudhoff's Archiv* (1985), p. 77.

⁴² Fuat Sezgin, *Geschichte des Arabischen Schrifttums* (Leiden: 1971), IV, pp. 230; 242; 246; 282.

⁴³ Manfred Ullmann, *Die Natur- und Geheimpwissenschaften im Islam*, in *Handbuch der Orientalistik* (Leiden: 1972), I Abt., Erg. VI, Abschnitt 2., p. 198.

⁴⁴ Kraus, *op. cit.*, pp. 5; 42; 45.

⁴⁵ Moritz Steinschneider, *Die Europaeischen Uebersetzungen aus dem Arabischen II, Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Phil/Hist. Klasse*, CLI (1905), p. 22.

⁴⁶ Julius Ruska, 'Uebersetzung und Bearbeitungen von Al-Rāzi's Buch *Geheimnis der Geheimnisse*, *Quellen und Studien zur Geschichte der Naturwissenschaften und der Medizin*, IV, Heft 3 (1935), p. 9, n. 50.

⁴⁷ Berthelot, *op. cit.*, III, pp. 91-98 of the Arabic text.

⁴⁸ Cf. *Appendix* to the present article: lines 1-2 of Latin text.

⁴⁹ *Ibid.*, lines 62-3.

⁵⁰ Newman, 'The Genesis of the *Summa perfectionis*,' Section III., entitled 'The Relationship of the *Summa* to the *Liber septuaginta*...', pp. 288-298.

⁵¹ The *Seventy Books*, or *Kitāb al-Sab* 'in Arabic, form one of the most important works belonging to the *Jābir corpus*. Kraus gives a thorough description of their contents in *Jābir ibn Ḥayyān*..., II. The *Seventy Books* were translated in the twelfth century by Gerard of Cremona, as the *Liber septuaginta* or *Liber de septuaginta* (see Richard Lemay, in *Dictionary of Scientific Biography*, XV, (1978), Supp. I, 185, entry 65).

⁵² The 'weight' or 'pondus' referred to here represents the translator's rendering of *mizān* (Berthelot, III, 92 *et passim*), more properly translated as 'balance.' Kraus, *op. cit.*, explains *Jābir* 's 'theory of the balance' at length. This doctrine was

essentially an arithmological technique for manipulating arbitrarily assigned values of hot, cold, wet, and dry, corresponding to the four Aristotelian qualities, and perhaps deriving from the quantitative pharmacology of Galen's *De simplicibus medicinis* (Kraus, *op. cit.*, II, pp. 189-91). Needless to say, the Latin translator has understood none of this.

⁵³ The *Kitāb al-Mawāzīn* is mentioned in Berthelot, III, p. 97, but the texts do not correspond closely here.

⁵⁴ The incomplete text printed by Berthelot breaks off at this point (p. 98).

⁵⁵ Iafac Ascandet is Jābir's master Ja'far ibn Muḥammad al-Ṣādiq (mentioned earlier in the Arabic text: Berthelot, III, p. 94). For Jābir's relationship to Ja'far, see Kraus, I, p. XLI. As far as I know, this is the only occurrence in the Latin literature of Ja'far, at least in his role as Jābir's master.

⁵⁶ Since Berthelot's fragmentary Arabic text does not contain this passage, there is no way to verify or correct the curious Latin expression 'mendicus,' literally 'beggar.' 'Mendicus' may well be a misreading for 'medicus,' however, for the *K. al-Sab'in* does describe a fabulous sea creature called 'oceanic physician.' See Kraus, *op. cit.*, II, pp. 90-93.

⁵⁷ This sounds like a distillation process for extracting oil from the *mendicus* mentioned above.

⁵⁸ The external red and internal white mentioned here probably refer to Jābir's doctrine of *ẓāhir* and *bāṭin*, *manifestum* and *occultum* in Latin, according to which a given substance is thought to contain its opposite *in potentia* (Kraus, II, p. 228, especially n. 6).

⁵⁹ Despite the fact that Berthelot's text has already broken off by this point, this passage corresponds to an earlier section in the Arabic (Berthelot, III, p. 95, 7-8). This probably represents a point at which either the Latin or the Arabic manuscript tradition has undergone a major transposition.

JOHN HARVEY

CORONARY FLOWERS
AND THEIR 'ARABICK' BACKGROUND

The term 'coronary', derived from the Latin *coronarius*, means a flower suitable for a wreath or garland. The word came into fashion soon after 1600 to specify plants mainly or exclusively decorative, as distinct from those of commercial, dietetic or medicinal use. Although the word belongs especially to the seventeenth century, it expressed a development with roots going far back into the past, and specifically into the into the Mediaeval 'Arabick' world. In the context of flowering plants, 'Arabick' includes everything belonging to the Islamic civilization, and notably its cultural heritage expressed through the Arabic script, whether the language was Arabic, Persian, or Ottoman Turkish. It is unnecessary to traverse the whole field of Anglo-Arabic relations in the Middle Ages, but it is relevant that numerous Englishmen either lived in Spain or were otherwise associated with the transmission of knowledge from Arabic into Latin. Starting in the twelfth century, one could briefly cite Adelard of Bath, Robert of Ketton (or possibly of Reading), who translated the Qur'ān into Latin in 1140-43 and was back in London soon afterwards; Roger of Hereford; Alfred of Shareshill (Sareshell); and Daniel Morley, who returned to England from Toledo about 1185 with 'a precious multitude of books'.¹

Because of the realization that Christendom lagged behind Islam in the sciences as well as in medicine and natural history, it was proposed to found chairs of Arabic at the five great universities of Latin Christendom: Rome, Paris, Oxford, Bologna, and Salamanca, a proposal urged by Roger Bacon on Pope Clement IV in 1265. In the next century Richard of Bury, bishop of Durham, was active in the same sense between 1312 and the end of his life in 1345. It was a period also of marked English interest in plants, and it is significant that the first queen of Edward I from 1255 to her death in 1290, was Eleanor of Castile, sister of Alfonso X, patron of 'Moorish' learning and of Latin translations of scientific works from Arabic via Hebrew. At least one English clerk, Geoffrey of Eversley, is known to have been in the service of both the royal brothers-in-law, in 1276-82.²

It is perhaps no coincidence that several highly decorative plants are first reported in England in the century between 1250-1350: the Hollyhock, also known as the Rose of Spain (but ultimately from China); Lavender; a cultivated Pink or Carnation; and the Wallflower or Great Violet, specified as being called *keyrus* or *keyri* by the 'Saracens'; thanks to the conservatism of William Turner and of Linnaeus, it retains the name *cheiri* to this day. It is not mere speculation that suggests an active part played by Queen Eleanor: she sent abroad for grafts of choice fruit-trees, and employed gardeners from Aragon at King's Langley.³ The responsibility of Edward III's queen, Philippa of Hainault, for the introduction of Rosemary about 1340 is documented.⁴ It was from her herbers that a scented Pink was brought to the Stepney botanical garden of the Dominican Henry Daniel.⁵

It is to Friar Daniel that we owe, not only important translations of Latin medical works, but also our earliest strictly horticultural treatise, on the cultivation of Rosemary, and a major herbal in which he adds a substantial body of original observation to collections from earlier authorities.⁶ His authors, moreover, were not all classical: he frequently quotes from Rhazes (865-925), first translated into Latin in 1127; Avicenna (980-1037), translated about 1200; and Averroës (1126-1198), translated c. 1232. Daniel knew some 'Saracen' names of plants and recorded plant-lore which he received from recent converts—presumably the Jewish physicians from Spain who were received into the *Domus Conversorum* in Chancery Lane, and who cultivated the gardens there from 1368 to 1405.⁷

Quite apart from professional interest in herbs as a physician, Daniel was a notable ecologist, recording the many kinds of aspect and types of soil favoured by particular species. He was also keenly interested in the beauty of flowering plants, and the perfumes of aromatic herbs. Such aesthetic interests were typical of the 'Arabick' world and notably of Moorish Spain, where Ibn Baṣṣāl, botanist and gardener to the Moorish kings of Toledo and Seville successively, had devoted a section of his pioneering work on horticulture (c. 1080) to flowering and aromatic plants: the Rose, Wallflower and Stock, Violet, Lily, Narcissus, Hollyhock, Camomile; Basil, Marjoram, Balm, Rue and Wormwood.⁸

A century later Ibn al-'Awwām of Seville, writing an even larger book on gardening and agriculture, for the first time enunciates principles of landscape design and also lists varieties of flowering plants.⁹ Thus in Andalusia before AD 1200 there was artificial improvement and the selection of colour varieties and double forms. Improvement was also in progress in the Eastern lands of the Islamic civilisation, and in 1515 a Persian treatise was produced in Herat by Qasim ibn Yūsuf, describing doubles and colour varieties of Anemone, five sorts of Carnations, a dozen Hollyhocks, Iris, Lily, Narcissus,

Poppy, Ranunculus, fifteen kinds of Rose, Tulip, Violet, Waterlily, a dozen Wallflowers and Stocks, and the flowering shrub-mallow *Hibiscus syriacus*, in three sorts: white, mauve and red.¹⁰

About the same time great developments were under way in Constantinople, captured by the Ottoman Sultan Mehmed II in 1453. Within a generation splendid new gardens and parks had been laid out along the Bosphorus and Golden Horn, and the cult of Florists' Flowers took its rise. Within the first century of Ottoman rule Abu'l-Şu'ūd (Ebussuud Efendi), Grand Mufti under Suleiman the Magnificent for twenty-two years, became the first recorded collector and connoisseur of flowers, notably of narcissi in many forms.¹¹ Suleiman's successor Selim II, himself a collector of tulips and hyacinths, greatly increased the emoluments of his religious and presumably floricultural adviser. By the death of Abu'l-Şu'ūd in 1574 Istanbul had become the greatest plant-centre west of China.

By this time plants from the New World were being introduced, as well as those from the Near East, and an age of deliberate collecting had begun. There is, however, a clear distinction between the products of world exploration and those derived from trade with the Levant. Whereas American introductions and those from remoter Africa were wild plants, brought into cultivation for the first time, it was those from the Near East, and especially from Istanbul, that were coronary flowers in the strict sense: the results of ancient cultivation acquired not as botanical species but as improved varieties.

It was not only the voyages of discovery which produced major change. Internal developments in Europe, the social and political impact of Renaissance and Reformation, repeatedly altered the pattern of commerce. Abandoning the old dependence on Venetian galleys for supplies of spices and drugs, silk and jewels, London ships began in 1511 to make direct voyages to the Levant.¹² Later the overland route through Antwerp became a main source of foreign seeds in the later years of Henry VIII. Bulbs and plants from Ottoman Turkey began to arrive after the Imperial embassy of Ogier Ghiselin de Busbecq in 1554-62.¹³ This route was closed by the revolt of the Netherlands, and direct trade between England and the eastern Mediterranean was resumed. Politically, Queen Elizabeth allied herself with the Dutch Protestants and negotiated with the Porte. Although there was no Anglo-Turkish alliance, the trade mission of William Harborne in 1578-82 led to the founding of the Levant Company and to closer relations with the Arabick world.¹⁴

Harborne built on earlier foundations laid by Anthony Jenkinson (c. 1530-1611), who in 1553 had reached Aleppo and obtained trading privileges from Suleiman the Magnificent before going on to Bokhara in 1558, the first Englishman to reach Central Asia. On his return in 1561 Jenkinson opened negotiations for trade with Persia.¹⁵

The roll-call of Englishmen who followed Jenkinson and Harborne in furthering an understanding of the 'Arabick' world is long and remarkable. Many of them left detailed accounts of their journeys which also included descriptions of native plants; others sent home plants, wild and cultivated, from Turkey, Syria, Egypt and Iran. Most of them were, to a greater or lesser degree, permeated by Arabic scholarship. For example, George Sandys (1578-1644) went to Turkey, Egypt and Palestine in 1610-15, producing his *Relation of a Journey* on his return; and Sir Thomas Herbert (1606-1682) travelled through the East as far as Persia in 1627-29, publishing a *Description of the Persian Monarchy* in 1634 and an account of his journeys in 1638. Sir Peter Wyche (d. 1643) English ambassador in Constantinople (1627-39), in 1630 sent bulbs to John Tradescant, including an eastern cyclamen.¹⁶ It is noteworthy that when Edward Pococke, chaplain to the Turkey Merchants at Aleppo in 1630-36,¹⁷ returned to become the first Laudian professor of Arabic, he brought back plants: his plane-tree and fig-tree still survive at Christ Church. He also introduced the Cedar of Lebanon.¹⁸ The Levant Company managed to survive the twenty years of the Civil War and its aftermath, and we reach a new peak of interest in 'Arabick' matters among the early fellows of the Royal Society at the Restoration of 1660.

In 1657 Sir Thomas Browne, who in the following year was to publish *The Garden of Cyrus*, had composed for John Evelyn a remarkable list of 'Coronary or Garland - Plants not yet translated from foreign Regions or little known'. This was a compilation from books in print, largely concerned with the Americas or the Far East, but including also plants listed by Prosper Alpinus in his book of 1592 on the plants of Egypt: notably the Sweet Sultan (*Centaurea moschata*) which he calls 'Amberboi Turcarum'.¹⁹ Evelyn's own list of 'Coronarie Flowres for the parterr & Bordures', consists of fifty species, of which more than half came from or through Turkey.²⁰

Evelyn was also on terms of friendship with such figures as Christopher Wren (1632-1723), who took an interest in 'Arabick affairs'. When Wren surveyed Salisbury Cathedral in 1669, he had made

some Enquiry into the Rise and Progress of this *Gothick* Mode ... He was of opinion that what we now vulgarly call the *Gothick* ought properly and truly to be named the *Saracenick Architecture*, refined by the Christians, which first of all began in the East after the Fall of the *Greek* Empire by the prodigious Success of those People that adhered to *Mahomet's* Doctrine, who out of Zeal to their Religion, built Mosques, Caravansara's, and Sepulchres, wherever they came ... They then fell into a new Mode of their own Invention, tho' it might have been expected with better Sense, considering the *Arabians* wanted not Geometricians in that Age, nor the *Moors*, who translated many of the most useful of old *Greek* Books. ... The Holy War [the Crusades] gave the

Christians, who had been there, an Idea of the *Saracen* works, which were afterwards by them imitated in the West. . . .²¹

To return briefly to English links with the Near East: Sir Paul Rycaut (1628-1700) was secretary to the embassy at Constantinople in 1661, consul at Smyrna from 1667 to 1678, and published two major books on the Ottoman Empire. John Covel (1638-1722) was chaplain to the embassy in 1670-77, had an intimate knowledge of botany and drugs, and described and drew many plants which he observed in Thrace, Greece and Asia 'the less'.²³ Another clergyman, George Wheler (1650-1724) was in the Levant in 1675-6, bringing home with him the well-known shrubby St John's Wort miscalled 'Rose of Sharon'. He visited Brusa and there saw the Weeping Willow, apparently the first Englishman to comment upon it. It was introduced into England in 1692.²⁴

Several surgeons who practised in Turkey at the end of the century sent home plants or dried specimens: Alexander Sympson, from Gallipoli; Samuel Daniel, from Iskenderun; and William Clerk, from Smyrna. James Braylsford, a Turkey merchant, in 1700 gave James Petiver four books of plants which he had gathered in Palestine, Syria and on the banks of the Euphrates.²⁵ Two more chaplains to the Levant merchants deserve mention: the Revd Robert Huntington (1637-1701), at Aleppo in 1671-81, who sent back plants to Jacob Bobart at the Oxford Botanic Garden;²⁶ and Henry Maundrell (1665-1701), who went out in 1695, famous for his entertaining narrative of a journey to Jerusalem in 1697.²⁷

Botanically the most important figure came after the end of the century: William Sherard (1659-1728), a pupil of the great French botanist and traveller Tournefort, and founder of the Sherardian Chair of Botany at Oxford. Sherard was British Consul at Smyrna from 1703 to 1716, travelled in the country, and planted a notable garden there.²⁸ His stay in Turkey corresponded with the famous 'Lâle Devri' or Tulip Period, when Sultan Ahmed III (reigned 1703-1730) initiated the second Ottoman tulipomania, growing immense numbers of tulips in the hills near Manisa, some twenty miles from Smyrna.²⁹ The Revd Richard Pococke travelled extensively in the east in 1737-40, and his book of 1743 printed lists of plants.³⁰ Finally the two Russells, half-brothers, must be mentioned: Alexander (c. 1715-1768), physician at Aleppo in 1740-53, sent seeds to Peter Collinson in England, and wrote the *Natural History of Aleppo and Parts adjacent*, published in 1756. Patrick Russell (1727-1805), an outstanding botanist, succeeded his brother at Aleppo in 1753, and revised the *Natural History* for a second edition in 1794. Dried plants and drawings by him are in the Natural History Museum in London, along with plants collected by Alexander.³¹

What then were the plants derived from or through the Ottoman Empire in the course of two centuries of diplomacy, trade and exploration? To consider first a few trees and shrubs: the Horse Chestnut, in England by 1616; the Turkey Oak, not until 1735; the Lilac; 'Syringa' or *Philadelphus coronarius*; Oleaster; and the Storax tree; besides two important Roses, the Double Yellow, and the Musk Rose—the latter ultimately from Shiraz in Persia but which may have reached England via North Africa.³² Then there are the Coronary Flowers in a stricter sense: *Anemone coronaria*; Crown-Imperial; Cyclamen; the Day Lilies; Oriental Hyacinth; several Iris; the Constantinople variety of the Madonna Lily and the Scarlet Turk's Cap; *Muscari moschatum*, the Musk Hyacinth; *Narcissus tazetta*; the Oriental Ranunculus. All these, which had arrived by the time of Gerard in the 1590s, were mostly bulbous or tuberous. Between 1600 and 1640 came varieties of Crocus; the Constantinople Snowdrop; *Gladiolus byzantinus*; and several annual or herbaceous plants such as the Sweet Sultan; cultivated forms of *Dianthus*; and Tradescant's Turkey Purple Primrose.³³ Much later, in 1714, came the splendid vermilion perennial Poppy. Though overshadowed in quantity by the later introductions from other quarters of the globe, the quality of these plants is unsurpassable. It was this quality that had been recognised by eastern gardeners: Persians, Arabs and Turks, when they began to cultivate gardens of delight.³⁴ Thanks to the long English tradition of the 'Arabick' interest, we were able to acquire these treasures and to make them our own.

NOTES

¹ C. H. Haskins, *Studies in the History of Mediaeval Science* (Harvard University Press, 1924; reprint 1960). On Adelard of Bath see also J. Harvey, *Antiquaries Journal*, XLVIII (1968), 92-3; I. Bulmer-Thomas, *Archaeological Journal*, CXXXVI for 1979, 136-50. On Morley, see A. B. Emden, *A Biographical Register of the University of Oxford to A.D. 1500* (Oxford, 3 vols., 1957-9), p. 1315. For the general and literary background, see Dorothee Metlitzki, *The Matter of Araby in Medieval England* (Yale University Press, 1977).

² For Eversley, see E. S. Procter, *Alfonso X of Castile* (1951), p. 130.

³ J. Harvey, *Mediaeval Gardens* (London, 1981), p. 78; further detail in *Garden History Society Newsletter* 5 (Summer 1982), 3-4.

⁴ Harvey, *Garden History*, I, no. 1 (1972), 14-21.

⁵ BL, Arundel MS. 42, fo. 91v.

⁶ C. H. Talbot & E. A. Hammond, *The Medical Practitioners in Medieval England* (London, Wellcome Historical Medical Library, 1965), p. 79.

⁷ Harvey, *Mediaeval Gardens*, p. 161; Harvey in *Garden History*, XV no. 2 (1987), 81-93.

⁸ Ibn Baṣṣāl, *Libro de Agricultura*, ed. J. M. Millás Vallicrosa & M. Aziman (Tetuan, Instituto Muley el-Hasan, 1955). For Moorish attitudes to gardening, see James Dickie, *The Islamic Garden* (Dumbarton Oaks, 1976), pp. 89-105.

⁹ J. J. Clément-Mullet, *Le Livre de l'Agriculture* (2 vols., Paris, 1864-7). For the

development of gardening in southern Europe under Muslim influence during the Middle Ages, see Harvey, *Mediaeval Gardens*, pp. 37-51.

¹⁰ R. Pinder-Wilson, *The Islamic Garden* (1976), pp. 71-85;

Muhammad Mushiri, ed., *Irshād az-zara'ah* (Teheran, 1346 A.H./1967-8); Harvey, 'Gardening Books and Plant Lists of Moorish Spain', *Garden History* III no. 2 (1975), 10-21; Harvey, 'Turkey as a source of Garden Plants', *Garden History*, IV no. 3 (1976), pp. 21-42.

¹¹ Süheyl Ünver, 'The Narcissus in the history of flowers in Turkey', *The Daffodil and Tulip Year Book 1968* (London, Royal Horticultural Society), pp. 67-75.

¹² J. T. Bent, ed., *Early Voyages and Travels in the Levant* (Cambridge, Hakluyt Soc., LXXXVII, 1893), p. v.

¹³ *The Turkish Letters of Ogier Ghiselin de Busbecq*, trans. E. S. Forster (Oxford, 1927; reprint 1968).

¹⁴ S. A. Skilliter, *William Harborne and the Trade with Turkey 1578-1582* (British Academy, 1977); *Dictionary of National Biography* (London, 63 vols., 1885-1900). Henceforth it will be cited as *D.N.B.*

¹⁵ *D.N.B.*

¹⁶ *D.N.B.*; *Encyclopædia Britannica* (London & New York, 11th ed., 1910), vol. XXIV, p. 144; vol. XIV, p. 340; see also Prudence Leith-Ross, *The John Tradescants* (London, 1984), pp. 186, 199.

¹⁷ *D.N.B.*; *Encyclopædia Britannica*, vol. XXI, p. 873.

¹⁸ Mavis Batey, *Oxford Gardens* (Amersham, Avebury, 1982), p. 216.

¹⁹ *The Works of Sir Thomas Browne*, ed. G. Keynes (1964), III, p. 51.

²⁰ John Evelyn, *Directions for the Gardiner at Says Court*, ed. G. Keynes (London, Nonesuch Press, 1932), pp. 35-6.

²¹ S. Wren, ed., *Parentalia: or, Memoirs of the Family of the Wrens* (1750), pp. 303-6; see pp. 296-8; and J. Harvey, *Antiquaries Journal*, XLVIII, p. 87.

²² *D.N.B.*

²³ Bent, *Early Voyages* (1893), pp. 101-287; J. E. Dandy, *The Sloane Herbarium* (London: British Museum, 1958), p. 117; R. Desmond, *Dictionary of British and Irish Botanists and Horticulturists* (London, Taylor & Francis, 1977), p. 153; *D.N.B.*

²⁴ Desmond, *Dictionary*, (1977), pp. 653-4; *D.N.B.*; Dandy, *Herbarium* (1958), p. 230.

²⁵ Dandy, *Herbarium* (1958), pp. 219; 123; 113-4; 95.

²⁶ *D.N.B.*; Desmond, *Dictionary* (1977), p. 331 (as 'Huntingdon').

²⁷ *D.N.B.*

²⁸ *D.N.B.*; Desmond, *Dictionary* (1977), p. 555. For Sherard's garden at Seydiköy, see Evelyn Lyle Kalças, *Garden History*, VI, no. 2 (1978), pp. 26-8.

²⁹ Harvey, *Garden History*, IV, no. 3 (1976), p. 21; the first Turkish tulipomania was that of Selim II, *ibid.*, p. 24. See also F. J. Chittenden, ed., *Dictionary of Gardening*, (London, Royal Horticultural Society, 1956), p. 2161; W. Blunt, *Tulipomania* (Harmondsworth, 1950).

³⁰ Desmond, *Dictionary* (1977), pp. 498-9; *D.N.B.*

³¹ Desmond, *Dictionary* (1977), pp. 534, 535; *D.N.B.*

³² In modern times there has been much confusion regarding the Musk Rose (*Rosa moschata* Herrm.); see G. S. Thomas, *Climbing Roses Old and New* (London, 1965), pp. 48-57. It is regarded as a native of Shiraz: Habibollah Sabeti, *Native and Exotic Trees and Shrubs of Iran* (Teheran, 1966), no. 715.

³³ The purple Primrose is a subspecies of *Primula vulgaris* Hudson subsp. *sibthorpii* (Hoffmanns) W. W. Sm. & Forrest; Leith-Ross, *Tradescants* (1984), pp. 191, 283.

³⁴ The Turkish 'fixation on the garden' was symbolized at its apogee by standing potted plants each side of the tent-flaps of Ottoman commanders on campaign; see Godfrey Goodwin, 'Symbolic Visions of Byzantine and Ottoman Constantinople', *Transactions of the Oriental Ceramic Society* (1983-4), p. 95.

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